Science and Technology Division
The Library of Congress
Washington, D. C.
1961

AEROSPACE MEDICINE AND BIOLOGY

Formerly: Aviation Medicine

AN ANNOTATED BIBLIOGRAPHY

VOLUME IV

1955 LITERATURE

by

Arnold J. Jacobius
Roman Kenk
Leroy D. Davis
Elizabeth G. Koines
Ilga M. Plavnieks
Kristallo Voulgaris

Supported by the
U. S. National Aeronautics and Space Administration
U. S. Advanced Research Projects Agency
Defence Research Board of Canada

This publication is available from the following sources:

Volume I: Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., as PB no. 121543, at $4.00 a copy.

Volume II: Aerospace Medical Association, 2642 University Avenue, St. Paul 14, Minnesota, at $5.00 a copy, postpaid in the United States and Canada.

Volume III: Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., as PB no. 171029, at $6.00 a copy.

NOTE

Future volumes, each covering one year of literature, are scheduled to appear at semi-annual intervals. After Volume X, the series will be continued on a current basis. At present, a selection of about 75 abstracts are published monthly in Aerospace Medicine, and reprints are distributed free of charge to authorized agencies and institutions. Inquiries regarding publication and distribution should be directed to

The National Aeronautics and Space Administration
1520 H Street, N. W.
Washington 25, D. C.
Attn: Code ETD

Library of Congress Catalog Card No. 56-60078

CONTENTS

	Page
PREFACE	V
ABBREVIATIONS	VI
BIBLIOGRAPHY	1
SUBJECT INDEX	241
CORPORATE AUTHOR INDEX	325
KEY TO SUBJECT INDEX HEADINGS IN VOLUME I	[Insert]*)

*) As the Key to Subject Index Headings in Volume I will not be reprinted for subsequent volumes, this insert should be retained for future use.

KEY TO SUBJECT INDEX HEADINGS

IN VOLUME I

NOTE: To find a reference contained in Volume I of this bibliography and listed in the index that follows, look for the identification number in the left-hand column and find the corresponding author-year notation in the right-hand column. E. g., reference no. 257 in the index of this volume would refer to the abstract, Clark, R. T., 1952a, in Volume I.

Refer. number:	Notation in volume I:
1	Anonymous, 1952
2	Anonymous, 1952a
3	Anonymous, 1952aa
4	Anonymous, 1952ab
5	Anonymous, 1952ac
6	Anonymous, 1952ad
7	Anonymous, 1952ae
8	Anonymous, 1952af
9	Anonymous, 1952ag
10	Anonymous, 1952ah
11	Anonymous, 1952ai
12	Anonymous, 1952aj
13	Anonymous, 1952ak
14	Anonymous, 1952al
15	Anonymous, 1952am
16	Anonymous, 1952an
17	Anonymous, 1952ao
18	Anonymous, 1952ap
19	Anonymous, 1952aq
20	Anonymous, 1952ar
21	Anonymous, 1952as
22	Anonymous, 1952at
23	Anonymous, 1952au
24	Anonymous, 1952av
25	Anonymous, 1952aw
26	Anonymous, 1952ax
27	Anonymous, 1952ay
28	Anonymous, 1952az
29	Anonymous, 1952b
30	Anonymous, 1952ba
31	Anonymous, 1952bb
32	Anonymous, 1952bc
33	Anonymous, 1952bd
34	Anonymous, 1952be
35	Anonymous, 1952bf
36	Anonymous, 1952bg
37	Anonymous, 1952bh
38	Anonymous, 1952bi
39	Anonymous, 1952bj
40	Anonymous, 1952bk
41	Anonymous, 1952bl
42	Anonymous, 1952bm
43	Anonymous, 1952bn
44	Anonymous, 1952bo
45	Anonymous, 1952bp
46	Anonymous, 1952bq
47	Anonymous, 1952br
48	Anonymous, 1952bs
49	Anonymous, 1952bt
50	Anonymous, 1952c
51	Anonymous, 1952d
52	Anonymous, 1952e
53	Anonymous, 1952f
54	Anonymous, 1952g
55	Anonymous, 1952h
56	Anonymous, 1952i
57	Anonymous, 1952j
58	Anonymous, 1952k
59	Anonymous, 1952l
60	Anonymous, 1952m
61	Anonymous, 1952n
62	Anonymous, 1952o
63	Anonymous, 1952p
64	Anonymous, 1952q
65	Anonymous, 1952r
66	Anonymous, 1952s
67	Anonymous, 1952t
68	Anonymous, 1952u
69	Anonymous, 1952v
70	Anonymous, 1952w
71	Anonymous, 1952x
72	Anonymous, 1952y
73	Anonymous, 1952z
74	Abt, J. C., 1952
75	Achiary, 1952
76	Adams, M. M., 1952
77	Adamson, G. L., 1952
78	Adiseshiah, W. T. V., 1952
79	(Aeronaut. Med. Equip. Lab.), 1952
80	(Air Force), 1952
81	(Air Force), 1952a
82	Alexander, L., 1952
83	Allard, [A.], 1952
84	Allard, A., 1952a
85	Alluisi, E. A., 1952
86	Alluisi, E. A., 1952a
87	Alluisi, E. A., 1952b
88	Altland, P. D., 1952
89	A[lvarez], W. C., 1952
90	Ames, S. W., 1952
91	Anastasi, A., 1952
92	Anderton, D. A., 1952
93	Anson, B. J., 1952
94	(Armed Forces-NRC Vision Comm.), 1952
95	Armstrong, G. E., 1952
96	Armstrong, H. G., 1952
97	Armstrong, H. G., 1952a
98	Arnould, P., 1952
99	Aschan, G., 1952
100	Astbury, A. K., 1952
101	Aström, A., 1952
102	Aström, A., 1952a
103	Atkinson, C. J., 1952
104	Atkinson, C. J., 1952a

KEY TO SUBJECT INDEX HEADINGS

Refer. number:	Notation in volume I:
105	Atria, N. F., 1952
106	Aviado, D. M., 1952
107	Aviado, D. M., 1952a
108	Axelrod, D. R., 1952
109	Axelrod, D. R., 1952a
110	Bahrick, H. P., 1952
111	Bair, J. T., 1952
112	Bair, J. T., 1952a
113	Bair, J. T., 1952b
114	Baldes, E. J., 1952
115	Balke, B., 1952
116	Ballinger, E. R., 1952
117	Barch, A. M., 1952
118	Barron, C. I., 1952
119	Bartlett, D. J., 1952
120	Bauer, L. H., 1952
121	Bauer, R. O., 1952
122	Bauer, R. O., 1952a
123	Beals, L. S., 1952
124	Beals, L. S., 1952a
125	Bean, J. W., 1952
126	Bean, J. W., 1952a
127	Bean, J. W., 1952b
128	Beard, E. F., 1952
129	Beard, E. F., 1952a
130	Beard, M. G., 1952
131	Beck, G. J., 1952
132	Bedwell, M. E., 1952
133	Bedwell, M. E., 1952a
134	Békésy, G. von, 1952
135	Beltran, L., 1952
136	Benchimol, R., 1952
137	Benchimol, R., 1952a
138	Benchimol, R., 1952b
139	Benchimol, R., 1952c
140	Benchimol, R., 1952d
141	Benchimol, R., 1952e
142	Bénitte, A. C., 1952
143	Bénitte, A. C., 1952a
144	Berg, P., 1952
145	Bergeret, P., 1952
146	Berkeley, M. H., 1952
147	Berkowitz, L., 1952
148	Berry, L. J., 1952
149	Berry, L. J., 1952a
150	Berry, L. J., 1952b
151	Besnard, G. G., 1952
152	Beyne, J., 1952
153	Beyne, J., 1952a
154	Biel, W. C., 1952
155	Biget, P., 1952
156	Biget, P. L., 1952
157	Bijout, R., 1952
158	Bilodeau, E. A., 1952
159	Bilodeau, E. A., 1952a
160	Bilodeau, E. A., 1952b
161	Bilodeau, E. A., 1952c
162	Bilodeau, E. A., 1952d
163	Bilodeau, E. A., 1952e
164	Binet, L., 1952
165	Binet, L., 1952a
166	Binet, L., 1952b
167	Binet, L., 1952c
168	Bitterman, M. E., 1952
169	[Bjuggren, B.], 1952
170	Bjurstedt, H., 1952
171	Black, J. W., 1952
172	Blanc, E., 1952
173	Blanc, E., 1952a
174	Blount, R. H., 1952
175	Boles Carenini, B., 1952
176	Bolt, R. H., 1952
177	Bond, D. D., 1952
178	Boothby, W. M., 1952
179	Boothby, W. M., 1952a
180	Boring, R. O., 1952
181	Boura, M., 1952
182	Bouverot, P., 1952
183	Bowen, H. M., 1952
184	Bowen, H. M., 1952a
185	Box, N. E. H., 1952
186	Boysen, J. E., 1952
187	Branscomb, B. V., 1952
188	Broadbent, D. E., 1952
189	Broadbent, D. E., 1952a
190	Brody, S. I., 1952
191	Brogan, F. A., 1952
192	Brognoli, C., 1952
193	Broussard, I. G., 1952
194	Brown, Arnold L., 1952
195	Brown, Arnold L., 1952a
196	Brown, Barbara, 1952
197	Brown, John L., 1952
198	Brown, John L., 1952a
199	Brown, John L., 1952b
200	Brown, Kenneth T., 1952
201	Brozek, J., 1952
202	Buettner, K., 1952
203	Buettner, K., 1952a
204	Buettner, K., 1952b
205	Bugard, 1952
206	Bugard, P. J., 1952
207	(Bur. Safety Invest.), 1952
208	(Bur. Safety Invest.), 1952a
209	(Bur. Safety Invest.), 1952b
210	(Bur. Safety Invest.), 1952c
211	(Bur. Safety Invest.), 1952d
212	(Bur. Safety Invest.), 1952e
213	(Bur. Safety Invest.), 1952f
214	Burch, B. H., 1952
215	Burkhardt, W. L., 1952
216	Burnright, T. R., 1952
217	Burr, H. S., 1952
218	Byrnes, V. A., 1952
219	Byrnes, V. A., 1952a
220	Campbell, P. A., 1952
221	Campbell, P. A., 1952a
222	Cannon, J. L., 1952
223	Cannon, J. L., 1952a
224	Cassen, B., 1952
225	Cassen, B., 1952a
226	Cassen, B., 1952b
227	Cerf, J., 1952
228	Chardon, 1952
229	(Chem. Corps Med. Lab.), 1952
230	Chinn, H. I., 1952
231	Chinn, H. I., 1952a
232	Chinn, H. I., 1952b
233	Chinn, H. I., 1952c
234	Chinn, H. I., 1952d

KEY TO SUBJECT INDEX HEADINGS

Refer. number:	Notation in volume I:
235	Chinn, H. I., 1952e
236	Chinn, H. I., 1952f
237	Chiodi, H., 1952
238	Choy, D. S. J., 1952
239	Christal, R. E., 1952
240	Christensen, J. M., 1952
241	Christy, R. L., 1952
242	Cibis, P. A., 1952
243	Cibis, P. A., 1952a
244	Cibis, P. A., 1952b
245	Cibis, P. A., 1952c
246	Cibis, P. A., 1952d
247	Cibis, P. A., 1952e
248	(Civil Aeronaut. Board), 1952
249	(Civil Aeronaut. Board), 1952a
250	Clamann, H. G., 1952
251	Clark, B., 1952
252	Clark, B., 1952a
253	Clark, B., 1952b
254	Clark, B., 1952c
255	Clark, B., 1952d
256	Clark, R. T., 1952
257	Clark, R. T., 1952a
258	Clements, R., 1952
259	Cohen, J., 1952
260	Cole, C. H., 1952
261	Coltart, W. D., 1952
262	Comfort, E., 1952
263	Comstock, C. C., 1952
264	Conley, M., 1952
265	Conybeare, Sir J., 1952
266	Cook, S. F., 1952
267	Cordier, D., 1952
268	Corliss, H. H., 1952
269	Cotes, J. E., 1952
270	Cotes, J. E., 1952a
271	Covell, W. P., 1952
272	Cowles, J. T., 1952
273	(Crash Injury Res.), 1952
274	(Crash Injury Res.), 1952a
275	Crema, A., 1952
276	Crook, M. N., 1952
277	Crumley, L. M., 1952
278	Cullumbine, H., 1952
279	Cunha, R., 1952
280	Dagett, M., Jr., 1952
281	Daley, E. A., 1952
282	Damasio, R., 1952
283	Dambly, 1952
284	Deese, J., 1952
285	DeHaven, H., 1952
286	DeHaven, H., 1952a
287	DeHaven, H., 1952b
288	DeHaven, H., 1952c
289	Dekking, H. M., 1952
290	Deschwanden, J. von, 1952
291	Dexter, L., 1952
292	Dhiraputra, S., 1952
293	Diamant, H., 1952
294	Diamond, A. L., 1952
295	Dickie, R. D., 1952
296	Dickson, E. D. D., 1952
297	Dietz, W. C., 1952
298	Dinsmore, R. A., 1952
299	Diringshofen, H. von, 1952
300	Döbeln, W. von, 1952
301	Doesschate, G. T. ten, 1952
302	Donneson, A. J., 1952
303	Downey, V. M., 1952
304	Doyle, J. T., 1952
305	Doyle, J. T., 1952a
306	Dreyfus, C., 1952
307	Duane, T. D., 1952
308	Duane, T. D., 1952a
309	Duane, T. D., 1952b
310	DuBois, E. F., 1952
311	DuBois, P. H., 1952
312	Duguet, J., 1952
313	Duguet, J., 1952a
314	Duguet, J., 1952b
315	Duguet, J., 1952c
316	Duke, H. N., 1952
317	Duncan, C. P., 1952
318	Duncombe, A., 1952
319	Dunnahoo, G. L., 1952
320	Durante, U., 1952
321	Dustin, E. [H.], 1952
322	E., E., 1952
323	Edelberg, R., 1952
324	Edelmann, A., 1952
325	Edwards, T. M., 1952
326	Emerson, G. O., 1952
327	Erdbrink, W. L., 1952
328	Ericksen, S. C., 1952
329	Ericksen, S. C., 1952a
330	Eugster, J., 1952
331	Evans, T. C., 1952
332	Evrard, E., 1952
333	Evrard, E., 1952a
334	Evrard, E., 1952b
335	Evrard, E., 1952c
336	Evrard, E., 1952d
337	[Farnsworth, D.], 1952
338	Feinstein, R. N., 1952
339	Ferraris de Gaspare, P. F., 1952
340	Fields, P. E., 1952
341	Fitts, P. M., 1952
342	Fitts, P. M., 1952a
343	Flottorp, G., 1952
344	Flottorp, G., 1952a
345	Flückiger, E., 1952
346	Foitzik, L., 1952
347	Folsom, W. W., 1952
348	Forcher-Mayr, O., 1952
349	Fortier, G., 1952
350	Fox, M. S., 1952
351	Frankl, V. E., 1952
352	Fraser, D. C., 1952
353	F[rederick], W. R., 1952
354	Fry, G. A., 1952
355	Fryers, G. R., 1952
356	Fryers, G. R., 1952a
357	Frykholm, A., 1952
358	Frykholm, A., 1952a
359	Galiana, T. de, 1952
360	Gallagher, J. B., 1952
361	Ganguly, K. K., 1952
362	Gaspa, P. H., 1952
363	Gaspa, P. [H.], 1952a
364	Gatland, K. W., 1952

KEY TO SUBJECT INDEX HEADINGS

Refer. number:	Notation in volume I:
365	Gaul, L. E., 1952
366	Gee, A. H., 1952
367	Gee, A. H., 1952a
368	Gell, C. F., 1952
369	Gerathewohl, S. J., 1952
370	Gerathewohl, S. J., 1952a
371	Gerathewohl, S. J., 1952b
372	Gerathewohl, S. J., 1952c
373	Gerstner, H. B., 1952
374	Gibson, E. J., 1952
375	Gibson, J. J., 1952
376	Gibson, J. J., 1952a
377	Gierke, H. E. von, 1952
378	Gierke, H. E. von, 1952a
379	Gierke, H. E. von, 1952b
380	Gilinsky, A. S., 1952
381	Girling, F., 1952
382	Glaser, E. M., 1952
383	Glorig, A., 1952
384	Goldman, D. E., 1952
385	Goldman, D. E., 1952a
386	Gollwitzer-Meier, K., 1952
387	[Gordon, B. L.], 1952
388	Gordon, J. N., 1952
389	Gordon, M. A., 1952
390	Gordon, M. A., 1952a
391	Gordon, M. A., 1952b
392	Graettinger, J. S., 1952
393	Graf, K., 1952
394	Gragg, D. B., 1952
395	Graham, F., 1952
396	Grandpierre, R., 1952
397	Grandpierre, R., 1952a
398	Grandpierre, R., 1952b
399	Grandpierre, R., 1952c
400	Grandpierre, R., 1952d
401	Grandpierre, R., 1952e
402	Grandpierre, R., 1952f
403	Grandpierre, R., 1952g
404	Grandpierre, R., 1952h
405	Grandpierre, R., 1952i
406	Grandpierre, R., 1952j
407	Graybiel, A., 1952
408	Graybiel, A., 1952a
409	Graybiel, A., 1952b
410	Graybiel, A., 1952c
411	Graybiel, A., 1952d
412	Green, D. E., 1952
413	Grenell, R. G., 1952
414	Grice, G. R., 1952
415	Grierson-Jackson, W., 1952
416	Grognot, P. A., 1952
417	Grognot, P. [A.], 1952a
418	Grognot, P. A., 1952b
419	Grognot, P. [A.], 1952c
420	Groot, S. G. de, 1952
421	Gross, F., 1952
422	Gross, F., 1952a
423	Gubernale, A., 1952
424	Guedry, F. E., 1952
425	Guedry, F. E., 1952a
426	Guilbert, E. A., 1952
427	Guild, S. R., 1952
428	Guild, S. R., 1952a
429	Guilford, J. P., 1952
430	Guillemin, V., 1952
431	Guimaraes, G., 1952
432	Gulley, W. E., 1952
433	Gulley, W. E., 1952a
434	Gumbel, E. J., 1952
435	Haber, F., 1952
436	Haber, F., 1952a
437	Haber, F., 1952b
438	Haber, H., 1952
439	Haber, H., 1952a
440	Haber, H., 1952b
441	[Haber, H.], 1952c
442	Haber, H., 1952d
443	Haber, H., 1952e
444	Haber, H., 1952f
445	Haber, H., 1952g
446	Haber, H., 1952h
447	Haber, H., 1952i
448	Hale, H. B., 1952
449	Hale, H. B., 1952a
450	Hall, A. L., 1952
451	Hall, A. L., 1952a
452	Hall, A. L., 1952b
453	Hall, A. L., 1952c
454	Hall, A. L., 1952d
455	Hall, F. G., 1952
456	Hall, F. G., 1952a
457	Halsey, R. M., 1952
458	Handford, S. W., 1952
459	Hansen, R. G., 1952
460	Harding, F. D., 1952
461	Harker, G. S., 1952
462	Harris, J. D., 1952
463	Harris, J. D., 1952a
464	Harris, J. D., 1952b
465	Harrold, M. C., 1952
466	[Hasbrook, A. H.], 1952
467	Hebraud, A., 1952
468	Hemingway, A., 1952
469	Hemingway, A., 1952a
470	Hemingway, A., 1952b
471	Hemphill, J. K., 1952
472	Hemphill, J. K., 1952a
473	Hemphill, J. K., 1952b
474	Hendler, E., 1952
475	Henry, J. P., 1952
476	Henry, J. P., 1952a
477	[Henry, J. P.], 1952b
478	Hermann, F. von, 1952
479	Hernando, O. J., 1952
480	Herrick, R. M., 1952
481	[Hester, W. R.], 1952
482	Heyl, E. B., 1952
483	Higginbotham, A. C., 1952
484	Hill, J. C., 1952
485	Hill, J. H., 1952
486	Hill, J. H., 1952a
487	Hillesund, R. A., 1952
488	Hirsh, I. J., 1952
489	Hirsh, I. J., 1952a
490	Hobson, G. N., 1952
491	Hoelscher, B., 1952
492	Hoelscher, B., 1952a
493	Hollander, E. P., 1952
494	Hollander, E. P., 1952a

KEY TO SUBJECT INDEX HEADINGS

Refer. number:	Notation in volume I:
495	Hollander, E. P., 1952b
496	Holtzman, W. H., 1952
497	Howard, J. K., 1952
498	Howland, D., 1952
499	Hsia, Y., 1952
500	Hubbard, H. H., 1952
501	Hubbard, H. H., 1952a
502	Huerkamp, B., 1952
503	Hull, W. E., 1952
504	Hull, W. E., 1952a
505	Hull, W. E., 1952b
506	Hull, W. E., 1952c
507	Hunley, H. C., 1952
508	Hunsaker, J. C., 1952
509	Hurley, L. A., 1952
510	Hyde, R. W., 1952
511	Hyde, R. W., 1952a
512	Ingalls, T. H., 1952
513	Jackson, M. M., 1952
514	Jaeger, W., 1952
515	Janitz, A. E., 1952
516	Johnson, W., 1952
517	[Johnson, W. H.], 1952
518	Johnson, W. H., 1952a
519	Johnston, M. B., 1952
520	Jones, Earl I., 1952
521	Jones, H[orace] L., 1952
522	Jones, Walton L., 1952
523	Jones, Walton L., 1952a
524	Jongbloed, J., 1952
525	Jordi, A. U., 1952
526	Jordi, A. [U.], 1952a
527	Jungmann, H., 1952
528	Kater, N. M., 1952
529	Kemph, J. P., 1952
530	Kemph, J. P., 1952a
531	Kendricks, E. J., 1952
532	[Kennebeck, G. R.], 1952
533	Kennedy, J. V., 1952
534	Kerr, T. H., 1952
535	Kimeldorf, D. J., 1952
536	Kimeldorf, D. J., 1952a
537	Kimeldorf, D. J., 1952b
538	King, B. G., 1952
539	Kline, R. F., 1952
540	Knoell, D., 1952
541	Knoepfel, H. K., 1952
542	Kobrak, H. G., 1952
543	Koochembere, C. T., 1952
544	Koolstra, J., 1952
545	[Kramer, K.], 1952
546	Krebs, A. T., 1952
547	Krebs, A. T., 1952a
548	Krendel, E. S., 1952
549	Krendel, E. S., 1952a
550	Krumm, R. L., 1952
551	[Kryter, K. D.], 1952
552	Kryter, K. D., 1952a
553	Laird, M., 1952
554	Lalli, G., 1952
555	Lansberg, M. P., 1952
556	Larsson, L. J., 1952
557	Lawrence, J. H., 1952
558	Lawrence, M., 1952
559	Lawton, A. H., 1952
560	Leczner, W. B., 1952
561	Lederer, L., 1952
562	LeHalle, P., 1952
563	Lemaire, R., 1952
564	Lemaire, R., 1952a
565	Lemley, J. M., 1952
566	Lett, J. E., 1952
567	Lett, J. C., 1952a
568	Lewis, B. M., 1952
569	Lewis, B. M., 1952a
570	Lewis, R. B., 1952
571	Ley, W., 1952
572	Lichte, W. H., 1952
573	Lichtenberg, J., 1952
574	Lincoln, R. S., 1952
575	Lindenberg, P., 1952
576	Lippert, S., 1952
577	Lombard, C. F., 1952
578	Lombard, C. F., 1952a
579	Lo Monaco [Croce], T., 1952
580	Lo Monaco [Croce], T., 1952a
581	Long, E. R., 1952
582	Long, E. R., 1952a
583	Lublin, A., 1952
584	Lucas, B. G. B., 1952
585	Lucas, J. D., 1952
586	Luft, U. [C.], 1952
587	Luft, U. C., 1952a
588	Lund, P., 1952
589	Lundberg, U., 1952
590	Lundberg, U., 1952a
591	Luria, L., 1952
592	Maag, C. H., 1952
593	MacCarty, E. S., 1952
594	McClanahan, E. C., 1952
595	[McCleary, R. A.], 1952
596	[McFarland, R. A.], 1952
597	McGraw, J. L., 1952
598	McIlnay, O. F., 1952
599	McIntosh, B. B., 1952
600	McIntyre, E., 1952
601	McLaughlin, S. C., 1952
602	MacPherson, A. E., 1952
603	McSurely, A., 1952
604	Madden, H. L., 1952
605	Madden, W. F., 1952
606	Mahler, W. R., 1952
607	Mahoney, D. I., 1952
608	Maison, G. L., 1952
609	Malmejac, J., 1952
610	Malmejac, J., 1952a
611	Malmejac, J., 1952b
612	Malmejac, J., 1952c
613	Malmejac, J., 1952d
614	Malmejac, J., 1952e
615	Mancioli, G., 1952
616	Mann, C. W., 1952
617	Mann, C. W., 1952a
618	Mann, C. W., 1952b
619	Mann, C. W., 1952c
620	Mann, C. W., 1952d
621	Marbarger, J. P., 1952
622	Marcks, C. A., 1952
623	Marks, G., 1952
624	Marley, F. W., 1952

KEY TO SUBJECT INDEX HEADINGS

Refer. number:	Notation in volume I:
625	Marshall, L. H., 1952
626	Martin, M. T., 1952
627	Martin, W. B., 1952
628	Mases, 1952
629	Mauclet, R., 1952
630	Maurath, J., 1952
631	[Mayo, A. M.], 1952
632	Mayo, A. M., 1952a
633	Mayo, A. M., 1952b
634	Mazza, V., 1952
635	Mendes, M. F., 1952
636	Mendes, M. F., 1952a
637	Mendes, M. F., 1952b
638	Mendes, M. F., 1952c
639	Mendes, M. F., 1952d
640	Mercier, A., 1952
641	Meyer, A. F., 1952
642	Middleton, R. H., 1952
643	Middleton, R. H., 1952a
644	Milch, L. J., 1952
645	Milch, L. J., 1952a
646	Milton, J. L., 1952
647	Milton, J. L., 1952a
648	Milton, J. L., 1952b
649	Mitra, S. K., 1952
650	Moles, A., 1952
651	Monteiro, A. R. de Castro, 1952
652	Monteiro, A. R. de Castro, 1952a
653	Moore, J. V., 1952
654	Morais, C., 1952
655	Morant, G. M., 1952
656	Morant, G. M., 1952a
657	Morant, G. M., 1952b
658	Morgan, C. T., 1952
659	Morsh, J. E., 1952
660	Moss, W. M., 1952
661	[Moss, W. W.], 1952a
662	Muller, H. J., 1952
663	Murga, R. H., 1952
664	Nahas, G. G., 1952
665	Nardin, 1952
666	(Naval Air Test), 1952
667	(Naval Med. Res. Lab.), 1952
668	Neely, K. K., 1952
669	Neifakh, E. A., 1952
670	Newman, R. W., 1952
671	Nicolas, 1952
672	Nielsen, M., 1952
673	Niess, O. K., 1952
674	Niven, J. I., 1952
675	(Noise--causes, effects), 1952
676	Numeroso, N., 1952
677	(Off. Tech. Services), 1952
678	Ogle, D. C., 1952
679	Olmstedt, J. M. D., 1952
680	Opitz, E., 1952
681	Opitz, E., 1952a
682	Owston, J., 1952
683	Packard, J. M., 1952
684	Packard, J. M., 1952a
685	Packard, J. M., 1952b
686	Parr, W. H., 1952
687	Parrack, H. O., 1952
688	Parrack, H. O., 1952a
689	Payne, B. A., 1952
690	Payne, R. B., 1952

Refer. number:	Notation in volume I:
691	Peiss, C. N., 1952
692	Pengelley, C. D., 1952
693	Pera, G., 1952
694	Pernet, A., 1952
695	(Personnel Res. Board), 1952
696	Peterson, A. C., 1952
697	Peterson, V. A., 1952
698	Phillips, R. B., 1952
699	(Physics and Medicine), 1952
700	Pickrel, E. W., 1952
701	Pierce, T. F., 1952
702	Placidi, T., 1952
703	Plant, W. H., 1952
704	Plas, F., 1952
705	Plas, [F.], 1952a
706	Poe, A. C., 1952
707	Poe, A. C., 1952a
708	Poe, A. C., 1952b
709	Pollack, I., 1952
710	Pollack, I., 1952a
711	Pollack, I., 1952b
712	Pollack, I., 1952c
713	Pollack, I., 1952d
714	Pollack, I., 1952e
715	Pollard, J. P., 1952
716	Pollock, W. T., 1952
717	Postle, J. A., 1952
718	Price, H. G., 1952
719	Prochnik, G., 1952
720	Pryor, W. W., 1952
721	(Psycho-Acoustic Lab.), 1952
722	(Psycho-Acoustic Lab.), 1952a
723	Pugh, L., 1952
724	Putt, D. L., 1952
725	Putt, D. L., 1952a
726	Rahn, H., 1952
727	Rait, W. L., 1952
728	Rawnsley, A. [I.], 1952
729	Rawnsley, A. I., 1952a
730	Raymond, M. P., 1952
731	Redmond, R. F., 1952
732	Regener, V. H., 1952
733	Reissmann, K. R., 1952
734	Reynolds, B., 1952
735	Reynolds, B., 1952a
736	Reynolds, J. B., 1952
737	Richey, H. W., 1952
738	Ringenbach, G., 1952
739	Rodewald, F. A., 1952
740	Rose, H. W., 1952
741	Rose, H. W., 1952a
742	Rose, H. W., 1952b
743	Rosenblith, W. A., 1952
744	Rothwell, S., 1952
745	Rudat, W., 1952
746	Rupe, J. C., 1952
747	Rusk, H. A., 1952
748	Rusk, H. A., 1952a
749	Sachs, L. D., 1952
750	Sala, O., 1952
751	Santos, F. R. dos, 1952
752	Savely, H. E., 1952
753	Schaefer, H. J., 1952
754	Schaefer, H. J., 1952a
755	Schaefer, H. J., 1952b
756	Schaefer, H. J., 1952c

KEY TO SUBJECT INDEX HEADINGS

Refer. number:	Notation in volume I:
757	Schaefer, K. E., 1952
758	Schaefer, K. E., 1952a
759	Schafer, G. E., 1952
760	Schapiro, H. B., 1952
761	Schiller, A. A., 1952
762	Schmidt, Ingeborg, 1952
763	Schmidt, Ingeborg, 1952a
764	Schmidt, L., 1952
765	Schreiber, H., 1952
766	Schreuder, O. B., 1952
767	Schulze, H. A., 1952
768	Schwab, R. S., 1952
769	Seabra, P., 1952
770	Sébas, R., 1952
771	Selkurt, E. E., 1952
772	Sellers, A. H., 1952
773	Sellers, A. H., 1952a
774	Sells, S. B., 1952
775	Senders, J. W., 1952
776	Senders, V. L., 1952
777	Senturia, B. H., 1952
778	Sexton, M. S., 1952
779	[Shaw, W. C.], 1952
780	Simon, C. W., 1952
781	Simonson, E., 1952
782	Simonson, E., 1952a
783	Sleight, R. B., 1952
784	Sleight, R. B., 1952a
785	Smedal, H. A., 1952
786	Smith, Allen D., 1952
787	Smith, Allen D., 1952a
788	Smith, E. A., 1952
789	Smith, William B., 1952
790	Smith, William M., 1952
791	Smith, Willie W., 1952
792	Specht, H., 1952
793	Spencer, J., 1952
794	Spragg, S. D. S., 1952
795	Stauffer, F. R., 1952
796	Stebbins, E. L., 1952
797	Steggerda, F. R., 1952
798	Steggerda, F. R., 1952a
799	Steggerda, F. R., 1952b
800	Sterner, J. H., 1952
801	Sterner, J. H., 1952a
802	Stieglitz, W. I., 1952
803	Storstein, O., 1952
804	[Stovall, W. R.], 1952
805	Stovall, W. R., 1952a
806	Stovall, W. R., 1952b
807	Strickland, B. A., 1952
808	Strickland, B. A., 1952a
809	Strong, H. L., 1952
810	Strughold, H., 1952
811	Strughold, H., 1952a
812	Strughold, H., 1952b
813	Strughold, H., 1952c
814	Strughold, H., 1952d
815	Stump, N. E., 1952
816	Sullivan, A., 1952
817	Sullivan, R. R., 1952
818	Switzer, R. E., 1952
819	Symonds, C., 1952
820	Tabusse, L., 1952
821	Tabusse, L., 1952a
822	Tabusse, L., 1952b
823	Tabusse, L., 1952c
824	Talbot, J. M., 1952
825	Taylor, C. L., 1952
826	Terzioglu, M. N., 1952
827	Terzioglu, M. N., 1952a
828	Terzioglu, M. N., 1952b
829	Thetford, P. E., 1952
830	Thompson, L. N., 1952
831	Thompson, M. E., 1952
832	Thorndike, R. L., 1952
833	Thorndike, R. L., 1952a
834	Tiedeman, D. V., 1952
835	Tobias, C. A., 1952
836	Tobias, C. A., 1952a
837	Tonndorf, J., 1952
838	Tonndorf, J., 1952a
839	Tonndorf, J., 1952b
840	Tonndorf, J., 1952c
841	Trumbull, R., 1952
842	Trumbull, R., 1952
843	Tryon, G. H., 1952
844	Tucci, E. A., 1952
845	(Tufts Exper. Psychol.), 1952
846	Tupes, E. C., 1952
847	Tupes, E. C., 1952a
848	Tupes, E. C., 1952b
849	Tupes, E. C., 1952c
850	Tupes, E. C., 1952d
851	Tupes, E. C., 1952e
852	Tye, W., 1952
853	Ulett, G. A., 1952
854	Vacca, C., 1952
855	Vail, E. G., 1952
856	Vail, E. G., 1952a
857	Vail, E. G., 1952b
858	Van Allen, J. A., 1952
859	Van Liere, E. J., 1952
860	Van Liere, E. J., 1952a
861	Vellard, J., 1952
862	Vellard, J., 1952a
863	Venturi, V. M., 1952
864	Verplanck, W. S., 1952
865	Verzár, F., 1952
866	Verzár, F., 1952a
867	Villalonga, J., 1952
868	Violette, F., 1952
869	Violette, F., 1952a
870	Wang, S. C., 1952
871	Wannemacher, E. P., 1952
872	Wapner, S., 1952
873	Warren, C. E., 1952
874	Warren, C. E., 1952a
875	Wechsler, R. L., 1952
876	Weeren, J. T. van, 1952
877	Weiner, J., 1952
878	Welch, G. E., 1952
879	Wells, J. G., 1952
880	Whipple, F. L., 1952
881	White, C. S., 1952
882	White, C. S., 1952a
883	White, C. S., 1952b
884	Whitehorn, W., 1952
885	Whiteside, T. C. D., 1952
886	Whiteside, T. C. D., 1952a

KEY TO SUBJECT INDEX HEADINGS

Refer. number:	Notation in volume I:
887	Whitney, K. R., 1952
888	Whittingham, H. E., 1952
889	Wiesinger, K., 1952
890	Wilcox, M., 1952
891	Wilcoxon, H. C., 1952
892	Wilkes, W. H., 1952
893	Wilkie, D. R., 1952
894	Wilson, M. R., 1952
895	Wilson, M. R., 1952a
896	Wing, K. G., 1952
897	Winge, M., 1952
898	Winterstein, H., 1952
899	Winterstein, H., 1952a
900	Witkin, H. A., 1952
901	Wittern, W. W. von, 1952
902	Wood, E. H., 1952
903	Worchel, P., 1952
904	Wulfften Palthe, P. M. van, 1952
905	Wulfften Palthe, P. M. van, 1952a
906	Wulfften Palthe, P. M. van, 1952b
907	Wulfften Palthe, P. M. van, 1952c
908	Zaccaria, L., 1952
909	Zaccaria, L., 1952a
910	Zachert, V., 1952
911	Zachert, V., 1952a
912	Zachert, V., 1952b
913	Zachert, V., 1952c
914	Zachert, V., 1952d
915	Zachert, V., 1952e
916	Zimmer, C. E., 1952
917	Zwislocki, J., 1952
918	Zwislocki, J., 1952a

NASA - Langley Field, Va.

PREFACE

The publication of this volume less than six months after the appearance of Volume III reflects the successful implementation of the accelerated program as stipulated under the agreement between the Library of Congress and the sponsoring agencies—the U. S. National Aeronautics and Space Administration, the U. S. Department of Defense (represented by ARPA), and the Defence Research Board of Canada. This was achieved while, at the same time, the output of the Aerospace Medicine Current Abstracts, published in Aerospace Medicine (and distributed as reprints by NASA to authorized agencies and institutions) was increased to 75 per month—a gain of about 30% over previous production.

There has been little change in this volume with regard to arrangement, format, style, and scope. The subject index has been expanded further to accommodate new headings and allow for better access by means of an improved cross-reference apparatus. The secondary author index has been omitted because a cumulative author index of principal and secondary authors will be included in Volume V scheduled to be published in a few months.

The reader will note the absence (with very few exceptions) of abstracts pertaining to earlier years, not included in the previous volumes. This is in accordance with a plan to confine all future volumes to the literature of the stated year and to collect all omitted items in a Supplement to be published as the concluding volume of the retrospective series.

The compilers wish to express their grateful acknowledgment and appreciation to the following persons for their valuable services and assistance: Dr. Harold Wooster and Mrs. Rowena Swanson, of OSR; Dr. Charles H. Roadman, Dr. George J. Jacobs, Miss Adeline Helland, and Mr. Bertram A. Mulcahy, of the NASA; Wing Comdr. D. Owens Coons of the Canadian Joint Staff and Lauchlan F. MacRae, of the Defence Research Board of Canada; Dr. Clair R. Spealman and Mr. Wilmer H. Baatz, of the FAA; Dr. Sam F. Seeley and Dr. Theodore C. Byerly, of the Armed Forces-NRC Committee on Bioastronautics; Dr. Benjamin S. Levine; Mr. Kurt B. Sandved; the reference staffs of the National Library of Medicine and of ASTIA; and the members of our own staff Dr. Eugene Marrow, Miss May Faye Dunsmore, Mrs. Loretta Franklin, Miss Clara L. Kuehn, Mr. John T. Lawson, Mrs. Cathryn W. Mitchell, and Mrs. Annette B. Schaefer.

ABBREVIATIONS

A. JOURNAL TITLES

The abbreviations used herein for journal titles are intended to save space without sacrificing ready recognition. Minor words such as articles and prepositions, and occasionally parts of long titles have been omitted, and the words and names occurring most frequently in titles are abbreviated. The following is a key to the title word abbreviations used:

Acad.	Academy	Jour.	Journal
Acoust.	Acoustic		
Aeronaut.	Aeronautical	Lab(s).	Laboratory(-ies)
Amer.	America(n)	Laryngol.	Laryngology
Arch.	Archives		
Assoc.	Association	Mag.	Magazine
		Med.	Medicine, Medical
Bacteriol.	Bacteriology		
Brit.	British	Nat.	National
Bull.	Bulletin		
		Ophthalmol.	Ophthalmology
Canad.	Canadian	Otol.	Otology
Coll.	College	Otolaryngol.	Otolaryngology
Compar.	Comparative		
Corp.	Corporation	Pathol.	Pathology
		Physiol.	Physiology
Dept.	Department	Proc.	Proceedings
Dermatol.	Dermatology	Psychol.	Psychology
Div.	Division		
		Quart.	Quarterly
Elec.	Electrical		
Endocrinol.	Endocrinology	Rev.	Review
Eng.	Engineering		
Exper.	Experimental	Sci.	Science
		Scient.	Scientific
Gaz.	Gazette	Soc.	Society
Gynecol.	Gynecology	Surg.	Surgery
Hyg.	Hygiene	Tech.	Technical
Inc.	Incorporated	Univ.	University
Indus.	Industrial		
Inst.	Institute		

B. AVAILABILITY SYMBOLS

As in the preceding volume, availability of materials is indicated by library or report-collection symbols (in capital letters), followed by a control number. The symbols are as follows:

*AD	ASTIA Document: available at ASTIA (Armed Services Technical Information Agency), Arlington Hall Station, Arlington 12, Virginia.
DLC	Library of Congress, Washington 25, D. C.
DNLM	National Library of Medicine, Washington 25, D. C. (formerly Library of the Surgeon General [DSG], then Armed Forces Medical Library [DAFM]).
PB	Publication Board: for sale by the Office of Technical Services, Department of Commerce, Washington 25, D. C.

*) Available on loan to members and contractors of the Department of Defense only.

BIBLIOGRAPHY

3692
Abel, R. C.
PASSENGER EMPLACEMENT. — Aeronautics (London), 31 (6): 32-33. Jan. 1955.
DLC (TL501.A5512, v. 31)

The design of aircraft passenger emplacements to meet the conditions of acceleration produced by sudden changes in lift or by collision is discussed. The envelope for the possible accelerations encountered is analyzed, and the functional limitations of the human body and of the seat belt are discussed. Several operational seats designed to meet the expected accelerations are described.

3693
ABSTRACTS FROM BASE AIRCREW EFFECTIVENESS REPORTS. — Tactical Air Command Surgeon's Bulletin, 5 (6): 14-18. June 1955. DNLM

Extracts from selected base aircrew effectiveness reports are presented concerning the following incidents: (1) occurrence of a temporary complete right homonymous hemianopsia during a routine decompression chamber flight; (2) medical observations of injuries sustained during two F-86D crash landings in which the pilots had either an unfastened safety belt and shoulder harness or an unfastened chin strap; (3) the unexplained crash of an aircraft whose pilot had recently become unconscious in an altitude chamber demonstration; and (4) initiation of ground parachute training for flying personnel.

3694
Adams, J. A.
A SOURCE OF DECREMENT IN PSYCHOMOTOR PERFORMANCE. — Jour. Exper. Psychol., 49 (6): 390-394. June 1955. DLC (BF1.J6, v. 49)

The effect of component response repetition on the decrement in over-all performance level of a tracking task was investigated using the Rotary Pursuit Test. The component response of visual pursuit and discrimination was singled out by having the subject press a button each time he judged his partner to be on target. It was established that interpolation of visual response repetition led to significantly lower time-on-target scores in a final practice session. Control groups showed that this decrement could not be attributed to work or interference effects of button pressing per se or the general fatigue effects of standing. Another group demonstrated that this decrement dissipated over rest. Reduction in amount of warm-up decrement also resulted from repetition of the visual response. Implications for reminiscence in bilateral transfer are discussed. (Author's summary, modified)

3695
Adams, O. S.,
D. J. Chambliss, and A. J. Riopelle
STIMULUS AREA, STIMULUS DISPERSION, FLASH DURATION, AND THE SCOTOPIC THRESHOLD. — Jour. Exper. Psychol., 49 (6): 428-436. June 1955.
DLC (BF1.J6, v. 49)

The pitches of pairs of complex tones at fundamental frequencies of 250 and 700 c.p.s. were measured; one tone of each pair contained only the lower partials, the other contained many strong high partials. Pitch was measured by having the subjects adjust the frequency of a pure tone until it equalled the complex tone in pitch. The pure and complex tones were equally loud. The subjects were university students who ranked in the upper 70% on the Seashore pitch test. Twenty-six subjects judged the pitch of the tones at 250 c.p.s., 23 subjects judged the tones at 700 c.p.s. Marked individual differences in pitch were found for each complex tone. At each frequency, the tone with the strong high partials was higher in pitch. The difference was equivalent to 8 cycles (.26 whole tones) at 250 c.p.s. and 10 cycles (.12 whole tones) at 700 c.p.s. The results did not seem to be caused by variation in the intensity settings of the complex tones. The overtone structure of a complex tone appears to influence its pitch to a degree that is of theoretical and practical significance. (Authors' summary)

3696
ADMISSION RATES FOR JANUARY 1955. — Tactical Air Command Surgeon's Bulletin, 5 (3): 16-17. March 1955. DNLM

For the seventh consecutive month the non-effective rate for the Tactical Air Command was 4 per 1000 absent daily because of illness or injury. The All Cause Hospital Admission Rate was

increased over the several preceding months, chiefly because of an increase in the respiratory disease rate. The injury admission rate was decreased to an all-time low.

3697
Adolph, E. F.,
and P. A. Hoy
POSTNATAL DEVELOPMENT OF DIURESIS IN RESPONSE TO HYPOXIA [Abstract]. — Federation Proceedings, 14 (1, part 1): 2. March 1955.
DLC (QH301.F37, v.14)

Exposure to an atmosphere with an oxygen partial pressure of 42-46 mm. Hg resulted within 2 minutes in anuria or oliguria in infant rats. Diuresis occurred 15-30 minutes later, and often persisted for 30-60 minutes after return to a normal atmosphere. Since the diuretic response to hypoxia was greater at 5 days of age than at 2 days of age, its development was seen to be postnatal.

3698
Aero Medical Lab. Directorate of Research
HAWKS DECOMPRESSION TYPE PRESSURE COMPENSATED EXHALATION VALVE PROTOTYPE EVALUATION. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical Memorandum Report no. WCRD 55-35, May 10, 1955. 8 p. (Project no. 7160, Task no. 71812). AD 69 220
UNCLASSIFIED

Evaluative tests were conducted on a Hawks combination explosive decompression relief and compensated exhalation valve to determine its suitability as a replacement for the standard Hawks compensated exhalation valve in the K-1 helmet pressure-breathing assembly. Explosive-decompression tests were conducted on the test valve, and helmet-pressure fluctuations were compared during normal and pressure breathing (20 to 100 mm. Hg) at ground level. The combination valve appeared to offer a practical solution to the problems of breathing and emergency exhalation in high-pressure helmets. Minor modifications which would produce desirable operational characteristics are listed. In a series of 20- to 70-min. tests in the cold chamber at -65° F., the heating unit prevented freezing and excessive damage to the valve decompression sensing device.

3699
Agostini, A.,
and G. Binda
[ALTERNATING REPOLARIZATION] Repolarizzazione alternante. — Folia cardiologica (Milano), 14 (2): 97-106. April 30, 1955. In Italian. DNLM

Electrocardiographic changes of the ST segment and the T wave were observed in two dogs rendered anoxic by breathing a mixture containing 7% oxygen in nitrogen. The same phenomenon was noted following the intravenous administration of pitressin (vasopressin). This change in the ST segment and T wave was a reversible phenomenon and could be reproduced many times in the same animal following the successive administration of pitressin. The phenomenon was often limited to a relatively circumscribed zone of the ventricle, most frequently in the region of the cardiac apex. A brief note is presented on the possible origins of the phenomenon, and the hypothesis is proposed that the change in repolarization is due to subendocardial insufficiency.

3700
Agrelo, R.,
and V. P. H. Gardella
[NOXIOUS GASES IN AVIATION] Los gases nocivos en la aviación. — Semana médica (Buenos Aires) 107 (2): 60-74. July 14, 1955. In Spanish. DNLM

A discussion is presented on the hazards to flight personnel of the inhalation of toxic gases (including carbon monoxide in exhaust, oxides of nitrogen, gasoline fumes, fumes from hydraulic fluids, cooling fluids, and lubricating oils, toxic fumes produced by hermetically sealed substances). A summary is included of the properties of normal and dry (without water vapor or humidity) atmospheres, mechanisms of respiratory gas exchange, and the regulation of respiration at normal and high atmospheric pressures.

3701
AIR AMBULANCE SERVICES, A SIDE LINE OF B. E. A.'S ACTIVITY. — I. T. A. Bulletin (Paris), 1955 (16), article 256/R. 3p. April 18, 1955.
DLC (TL502.I49)

Two de Havilland Herons have been supplied to British European Airways (B. E. A.) for use in an air ambulance service operating on a local call basis between the Scottish Isles and the mainland. Statistics of the number of flights, number of patients, and mileage flown by the B. E. A. ambulance service are given.

3702
(Air Proving Eglin)
EVALUATION OF GRADUATES OF AIRCRAFT CONTROL AND WARNING RADAR REPAIRMAN, AN/FPS-3, AN/FPS-6, COURSE. — Air Proving Ground Command, Eglin Air Force Base, Fla. Final Report, June 7, 1955. iv+27 p. (Project no. APG/CSC/500-A). AD 68 381 UNCLASSIFIED

Observations of the performance of representative graduates of Technical Training Air Force Course Number AB30332C, Aircraft Control and Warning Radar Repairman, AN/FPS-3, AN/FPS-6, were conducted to evaluate the ability of graduates to perform the work for which they were trained, to determine job areas in which training should be improved, and to provide information for optimum utilization of course graduates. Graduates of the course are capable of performing the duties of their specialty, at apprentice level, and possess the capability for development of senior level skill after approximately three months on the job. Their training would be improved by course reorientation to develop the ability to locate trouble quickly and systematically and by additional emphasis on the utilization of test equipment. (Quoted in part)

3703
(Air Proving Eglin)
EVALUATION OF GRADUATES OF K SERIES SYSTEM MECHANIC COURSE. — Air Proving Ground Command, Eglin Air Force Base, Fla. Final Report, July 21, 1955. iv+62 p. (Project no. APG/CSC/492-A). AD 68 555 UNCLASSIFIED

Observations of the performance of representative graduates of Technical Training Air Force Course No. AB32130E, K Series System Mechanic Course, were conducted to evaluate the ability of

graduates to perform the work for which they were trained, to determine job areas in which training should be improved, and to provide information for optimum utilization of course graduates. It was found that graduates of the course are not capable of performing the duties of apprentice mechanic upon assignment, nor can they progress to senior level skill within a reasonable period of time. It is suggested that the course be revised to extend training in electrical fundamentals, to provide better understanding of the function and operating principles of systems components, to increase the use of technical publications and test equipment in classroom work, and to stress systematic localization of trouble. (Quoted in part)

3704
(Air Proving Eglin)
OPERATIONAL SUITABILITY TEST OF GRADUATES OF TTAF COURSE NO. AB29333 AIRBORNE RADIO OPERATORS. — Air Proving Ground Command, Eglin Air Force Base, Fla. Final Report, July 21, 1955. iv+38 p. (Project no. APF/CSC/542-A). AD 68 383 UNCLASSIFIED

Discussion is presented on the selection, capabilities, limitations, and utilization of airborne radio operators. Results of the operational suitability tests showed that apprentices graduated from an airborne radio operator course are adequately trained to perform the basic duties of message transmission by code or voice, and of operation of the AN/ARC-8 liaison set. An extensive on-the-job training period of 6 months or more is required to develop to senior-level skill. The following recommendations are made: (1) training be included or intensified in in-flight and preflight maintenance procedures, and the use of command, navigation, IFF, and emergency equipment, and (2) an investigation be conducted to determine if equivalent proficiencies can be developed in shorter (possibly 2-hour) daily periods of radio code practice.

3705
AIRCRAFT ACCIDENTS. — U.S. Air Force Medical Service Digest, 6 (1): 7. Jan. 1955. DLC

A major cause of noneffectiveness in the U. S. Air Force are days lost due to aircraft accidents, particularly fighter aircraft. Examination of casual factors disclosed pilot error as the leading cause of accidents. A statistical analysis of the causative factors in major aircraft accidents for 1953 is given.

3706
AIRCREW EFFECTIVENESS. — Tactical Air Command Surgeon's Bulletin, 5 (1): 13-14. Jan. 1955. DNLM

Brief extracts are presented from selected Base Aircrew Effectiveness Reports for October 1954, concerning the problem of malfitting personal equipment and its relation to the occurrence of hypoxia in flight.

3707
AIRCREW EFFECTIVENESS REPORTS. — Tactical Air Command Surgeon's Bulletin, 5 (2): 14-15. Feb. 1955. DNLM

Information presented in brief extracts crom selected Base Aircrew Effectiveness Reports for November, 1954, includes: (1) Hearing impairment in individuals working with the RB-57A has been found to be confined to personnel who have refused to wear ear defenders. (2) The danger of toxic fumes resulting from synthetic oils collected in the compressor section of jet aircraft has been circumvented at one base by flushing of the cabin with ramair after takeoff and by use of 100% oxygen during take-off. (3) The need is being investigated for a better portable oxygen system for crew members required to work in the wing and accessory engine compartments of aircraft during in-flight emergencies. (4) A crash phone is being used at one base to relay crash information from the control tower to the base hospital.

3708
AIRCREW EFFECTIVENESS REPORTS. — Tactical Air Command Surgeon's Bulletin, 5 (12): 5-12. Dec. 1955. DNLM

Extracts from selected Air Crew Effectiveness Reports are presented. Incidents reported include: (1) localized frostbite caused by contact with a faulty heating and air vent system during flight, (2) loss of a fighter canopy at 24,000 feet, with no significant physiological effect on the pilot, and (3) hypoxia resulting from a disconnected oxygen system.

3709
AIRPLANES CHANGE BUT MAN DOESN'T. — Aviation Week, 62 (11): 222-229. March 14, 1955. DLC (TL501.A8, v. 62)

The relationship between man and modern aircraft is viewed as basically incompatible. With the accent on aircraft performance, the design often compromises the human factor which cannot be altered. Basic remedies suggested include designing the aircraft around the man, intensifying the study of man to arrive at precise numerical data, integrating the human-factor research team with the engineers and manufacturers, and training the developmental engineers in human factors.

3710
Åkerblad, B.
[A MOBILE LABORATORY FOR PHYSIOLOGICAL WORK] Mobilt arbetsfysiologiskt laboratorium. — Meddelanden från flyg-och navalmedicinska nämden (Stockholm), 4 (4): 14-21. 1955. In Swedish. DNLM

The author describes a bus equipped for on-the-spot examination of Swedish Air Force personnel, modeled on a similar undertaking in Slough, England. The laboratory carries ECG equipment as well as pulse- and respiratory rate meters, an oximeter, a gas analyzer, etc. All equipment is hinged or rests on rubber pads to reduce vibration damage. The experiment should be of particular value in the examination of older personnel (ECG) and in the Air Force's rehabilitation activities (examples are cited). Great time-saving results are predicted.

3711
Albrecht, R. E.,
and R. S. Crutchfield
THE SIZE-WEIGHT ILLUSION TEST IN PERSONALITY ASSESSMENT [Abstract]. — Amer. Psychologist, 10 (8): 329. Aug. 1955. DLC (BF1.A55, v. 10)

A Size-Weight Illusion Test was administered to 100 Air Force captains. The subject was shown two wooden blocks unequal in size but equal in weight; he was told that the larger block weighed 300 grams. He had to lift it once, then lift the smaller block and estimate its weight. After

twelve such trials, the subject performed six trials with the blocks made visually equivalent by placing paper covers over them, and six more trials with the covers removed. Officers exhibiting least susceptibility to the illusion were independently rated and scored as superior in intellectual traits, good judgment, and general soundness. The tendency for the illusion to decrease over twelve trials was also associated with favorable personality characteristics. Early stabilization of judgments appeared related to dominance, strong ego organization, and independence. Perseveration of the illusion under changed stimulus conditions was associated with greater rigidity, suggestibility, and emotional disturbance. The converse was associated with greated flexibility, intellect, and emotional spontaneity. (Abstract, modified)

3712 1954
Alcalá Ermindy, J. M.
[IMPORTANCE OF VISUAL FIELD EXPLORATION IN EXAMINATION OF THE PILOT] Importancia de la exploración del campo visual en el examen del piloto. —Ciencia aeronáutica (Caracas), 1 (1): 38-39. Sept. 1954. In Spanish. DLC

Procedures are briefly discussed for examination of the visual field of pilots (tests of photopia, scotopia, and perimetry). These tests are important in aviation medicine (1) for the diagnosis of visual field limitations and defects; (2) for the qualification of pilots for night flying, and (3) for the prevention of fatal aircraft accidents due to pilot errors caused by disorders of vision.

3713
Alella, A.
[CORONARY BLOOD FLOW AND HYPOXIA] Coronardurchblutung und Hypoxie. — Pflügers Archiv für die gesamte Physiologie (Berlin), 261 (4): 373-384. 1955. In German. DLC (QP1.A63, v. 261)

The interrelationships between arterial O_2 saturation, coronary blood flow, aortic pressure, and myocardial oxygen consumption were investigated in 28 hypoxic dogs. Increase in aortic pressure at constant O_2 saturation was associated with an increase in coronary blood flow and myocardial oxygen consumption, and a decrease in coronary vasodilatation. Decreasing arterial O_2 saturation at constant pressure caused an increase in coronary blood flow and coronary vasodilatation, and a decrease in myocardial oxygen consumption. The net effect of hypoxia (with the resulting increase of aortic pressure) was to increase coronary blood flow and vasodilatation and descrease myocardial oxygen consumption. Coronary efficiency increased with decreasing arterial O_2 saturation to 50%, but declined with decreases in O_2 saturation below this level.

3714
Alexander, I. E.,
and F. J. Githler
CHRONIC EFFECTS OF A HIGH-FREQUENCY STIMULUS ON THE STRUCTURE AND FUNCTION OF THE COCHLEA. — Jour. Exper. Psychol., 49 (5): 363-366. May 1955. DLC (BF1.J6, v.49)

Audiograms of electrophysiological sensitivity were determined in five guinea pigs prior to, immediately after, and three months after exposure to intense high-frequency sound stimulus. The immediate effects were manifested as a progressive decrement in sensitivity from the lowest tone to the higher tones. However, the chronic audiogram showed that with time marked changes occurred in the response to low tones resulting in a uniform decrement throughout the frequency range. Histological evaluation verified the primary locus of the lesion to be within 4-6 mm. from the beginning of the basal turn of the cochlea. In three cases, there was also injury to an area 1 to 2 mm. from the base. There is a probability that structures in the base of cochlea are very fragile and unusually susceptible to injury by tones with primary effect on the basal turn. The nonspecific effect of injury to a particular portion of cochlea suggests a general cochlear activity in regard to stimulus frequency, which does not account for pitch discrimination.

3715
Alexander, I. E.,
F. J. Githler, A. Deiss, and H. M. Radwin
SELECTIVE COCHLEAR DESTRUCTION, COCHLEAR POTENTIALS, AND HEARING LOSS. — A.M.A. Arch. Otolaryngol., 61 (1): 46-53. Jan. 1955. DLC (RF1.A7, v.61)

Behavioral (conditioned responses) and electrophysiological (cochlear potentials) measurements of sensitivity loss were made in guinea pigs after mechanical injury to the middle and apical portions of the cochlea. In apical lesions, low-tone sensitivity was more affected than high-tone sensitivity. In lesions extending from the apex to the middle of the cochlea, the high-tone sensitivity was close to that observed for the low tones. Behavioral characteristics were more closely related to subsequent histological findings than were the measurements of the cochlear electrical responses. These results are discussed with relation to the theory of pitch perception; they support the assumption that only gross information about pitch is supplied by the localization patterns in the cochlea.

3716
Alexander, S. J.,
M. Cotzin, and G. R. Wendt
CHEMICAL INFLUENCES ON BEHAVIOR. I. THE EFFECTS OF A SMALL DOSE OF HYOSCINE ON PERFORMANCE. — Jour. Psychol., 39 (2): 389-402. April 1955. DLC (BF1.J67, v.39)

Doses of 0.6 mg. hyoscine hydrobromide (motion-sickness preventive drug) were given orally to 16 young male adults for comparison with the effects of a placebo administered under the same conditions. Eleven performance tests were administered. Seven of the tests showed negligible differences between drug and placebo days (arithmetic, addition, same-opposites, disarranged sentences, analogies, complex coordinator); one (following directions) showed 5% poorer performance on hyoscine days; three showed better performance on hyoscine days (rifle target fire 7%, judgment 3%, code substitution 3%). Only the differences in following directions and in code substitution were statistical-

ly reliable at better than the 5% standard. These results appear to confirm the tentative conclusion (based on previous studies) that a single small dose of hyoscine by mouth does not damage performance of active men enough to contraindicate its use. (Authors' summary, modified)

3717
Alexander, S. J.,
M. Cotzin, C. J. Hill, E. A. Ricciuti, and G. R. Wendt
STUDIES OF MOTION SICKNESS. X. EXPERIMENTAL PROOF THAT AVIATION CADETS TELL THE TRUTH ON MOTION SICKNESS HISTORY QUESTIONNAIRES. — Jour. Psychol., 39 (2): 403-409. April 1955. DLC (BF1.J67, v. 39)

A personal-history questionnaire, containing 14 questions concerning motion sickness in various situations interspersed among personal and medical history questions, was administered to 349 naval aviation cadets after they had undergone a series of tests during selection enlistment and indoctrination. One to ten weeks later the subjects were exposed to motion on the vertical accelerator. Performance tests were administered before and after the exposure. In conclusion each subject was interviewed and cooperated in filling out a motion-sickness inventory on essentially the same items as appeared in the questionnaire. The results show that 80% of the answers were identical. Deviations from the original answers were small and explained on the basis of difference in interpretation, additional experience, errors of entry, and difference in opinion as to the cause of sickness. This study does not support the claim that aviation cadets may be expected to falsify questionnaire answers.

3718
Alexander, S. J.,
M. Cotzin, J. B. Klee, and G. R. Wendt
STUDIES OF MOTION SICKNESS. XIII. THE EFFECTS OF SICKNESS UPON RIFLE TARGET SHOOTING. — Jour. Psychol., 39 (2): 411-415. April 1955. DLC (BF1.J67, v. 39)

Tests of accuracy and speed of rifle fire at 25 ft. from the target were administered to 117 subjects before and after exposure to motion on a vertical accelerator. Deficits in performance by those who became motion-sick (26 subjects) were small and not statistically reliable. Sick subjects tended to predict that their sickness would produce a deterioration in performance. Neither susceptibility to motion sickness nor past history of motion sickness had a relationship to pre-exposure skill.

3719
Allard, A
[RESULTS OF SYSTEMATIC EXAMINATIONS OF AVIATION PERSONNEL] Résultats des examens systématiques du personnel navigant. — Médecine aéronautique (Paris), 10 (4): 491-497. 1955. In French. DLC (TL555.M394, v. 10)

Results obtained from the semiannual examination of Belgian aviation personnel from January 1950 to July 1955 are briefly reviewed. In laboratory, radiographic, and clinical examinations, no significant variations from other personnel in incapacities caused by work were found. Loss of hearing occurred infrequently among personnel flying modern aircraft, although radiomen continued to be slightly afflicted. No connection was indicated between the number of hours of flight and incapacity. Personnel such as hostesses and clerks showed more fatigue than flying personnel because of the continuous nature of their work.

3720
Allehaut, P.,
J. Raboutet, and J. Curveillé
[TROPICAL PATHOLOGY AND AVIATION (MALARIA, AMEBIASIS)] Pathologie tropicale et aviation (paludisme, amibiase). — Médecine aéronautique (Paris), 10 (4): 421-436. 1955. In French. DLC (TL555.394, v. 10)

A discussion of tropical diseases encountered among aviation personnel is presented. The occurrence, protective measures, symptoms, diagnosis, treatment, and prognosis of malaria and amebiasis are described.

3721
Allen, W. H.
ANALYSIS OF SURVIVAL EQUIPMENT (AU 387-54-RSI, REVISED). — Arctic, Desert, Tropic Information Center, Maxwell Air Force Base, Ala. ADTIC Publication no. G-105, May 1955. 76p. AD 118 665 PB 129928

An assessment is made of the capabilities of current standard survival equipment from data obtained from official reports of survival incidents and from interviews with Air Rescue personnel, survival training instructors, personal-equipment technicians, and others who use survival equipment. From the data available, the primary problem of survival equipment is considered to be its availability when needed rather than its adequacy and efficiency. The main reason for the absence of survival equipment in most emergencies seems to be its bulkiness and inconvenience; other reasons for nonavailability of equipment are supply difficulties and training and discipline problems. Analysis of survivors' reports indicates that a survival incident may have four phases: lifesaving, signaling, shelter and subsistence, and life as a prisoner. Korean war experience indicates that as much survival gear as possible should be integrated into a man's clothing and personal equipment, not carried outside of the clothing in separate packs or kits, nor carried in pockets of flying clothing. (From the AD abstract).

3722
Alluisi, E. A.
MEASURED VISUAL ACUITY AS A FUNCTION OF PHENOMENAL SIZE. — Ohio State Univ., Columbus; issued by Wright Air Development Center, Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-384, Oct. 1955. iv+ 14 p. (Project no. 7186). AD 90 914 UNCLASSIFIED

The usual definition of visual acuity implicitly assumes that acuity is independent of phenomenal size as long as the test object subtends a constant visual angle at the retina. Evidence from some previous studies indicates, however, that measured

visual acuity might be bettered when the test object is made to appear larger even though its objective size on the retina remains constant. The present study was designed to test this notion. In a daylight situation favorable to the operation of size constancy (condition S), 36 observers read a retinally projected visual acuity chart at three convergences, and, thus, at three apparent distances and three conditions of phenomenal size of the chart. An additional 36 observers read the same retinally projected chart under similar conditions, but in a stimulus-reduced night situation (condition R); for this group, phenomenal size of the test chart remained constant. Acuities measured at the three convergences differed significantly among themselves in condition S, but not in condition R. This seems to establish measured visual acuity as a function of phenomenal size of the test chart. The effect was so small (less than one Snellen rating), it appears to be of little practical or clinical importance. It does, however, offer statistical support to those theories allowing for central factors in measured visual acuity. (Author's abstract)

3723
Alzamora, R.,
and C. Monge M.
[ELECTROCARDIOGRAPHIC MODIFICATIONS IN THE ANDEAN DURING HIS ADAPTATION TO SEA LEVEL] Modificaciones electrocardiográficas en el andino durante su adaptación al nivel del mar. — Anales de la facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Peru), 38 (1): 65-73. 1955. In Spanish. DNLM

Electrocardiographic tracings of Andean natives living at Huancayo, Peru (10,170 feet), and at Morococha, Peru (14,900 feet) displayed changes primarily in the AQRS, ST, and V waves during their adaptation to sea level (Lima, Peru, 500 feet). It is noted that the state of increased ventricular volume and hyperactivity which exists at high altitudes does not persist at sea level but is gradually modified.

3724
Ambler, R. K.
THE AVIATION QUALIFICATION TEST AS A PREDICTOR OF THE PRE-FLIGHT ACADEMIC FINAL GRADE. — In: Research notes from the Aviation Psychol. Lab., p. 1-4. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 108 100.07, March 15, 1955. AD 74 676
UNCLASSIFIED

A brief discussion and table are presented to show the high correlation between scores obtained by naval aviation cadets on the Aviation Qualification Test and their Pre-Flight ground final grades.

3725
Ambler, R. K.
CHARACTERISTICS OF THE REVISED AVIATION SELECTION TEST BATTERY ADMINISTERED EXPERIMENTALLY TO NAVAL AVIATION CADETS. — Naval School of Aviation Medicine, Pensacola, Fla. July 1, 1955. iv+13+[6]p. (Project no. NM 001 108 102, Report no. 1). AD 77 748
UNCLASSIFIED

This investigation evaluated the tests of the revised aviation selection battery. The Aviation Qualification Test predicted ground school grades satisfactorily. The Spatial Apperception Test, the Mechanical Comprehension Test, and the Biographical Inventory each correlated significantly with the attrition criteria for 1109 cadets. The revised Flight Aptitude Rating (FAR) correlated higher with criteria than did the previous FAR which it replaced. Differential weighting of the separate tests increased predictiveness of the FAR. Effects of restriction of range on the findings are discussed. Appendixes of technical data are included. (Author's abstract)

3726
Ambler, R. K.
PRE-TRAINING FLIGHT EXPERIENCE LEVELS IN RELATION TO APTITUDE TEST SCORES AND ATTRITION FROM THE NAVAL AIR TRAINING PROGRAM. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 1, 1955. ii+8 p. (Research Project no. NM 001 108 102, Report no. 2).
AD 85 671 UNCLASSIFIED

This research investigated the interrelationship among pre-training flight experience levels, aptitude test scores, and pass/attrition criterion data for a group of 1190 naval aviation cadets. It was found that these three variables were significantly interrelated. However, the present selection battery maintained its validity for predicting the criteria when flight experience was held constant. In addition it was established that augmentation of the Flight Aptitude Rating (FAR) score with credit for flight experience yielded no significant improvement in selection since these two variables performed an overlapping function in predicting the criteria. (Author's abstract)

3727
Ambrose, A. M.,
F. DeEds, and P. V. Marsh
EFFECTS OF RUTIN ON EXPERIMENTAL COLD INJURY. — Federation Proceedings, 14 (1[I]): 314. March 1955. DLC (QH301.F37, v. 14)

Addition of rutin to the adequate basal diet before and after exposure to -30° to -32° C. for 15 minutes or to -3° to +8° C. for extended periods had no protective effect against cold injury in rats. Rutin had no compensatory protective effect during exposure to -3° to +8° C. in rats or guinea pigs fed diets deficient in vitamin A. Addition of ascorbic acid to the basil diet of guinea pigs prolonged survival, while addition or substitution of rutin had no effect.

3728
American Inst. For Research
[PERSONNEL OPERATIONS]. — American Inst. for Research, [Pittsburgh, Pa]. (Contract DA-49-083). Annual Project Progress Report CSPRD-1, Dec. 31, 1955. 2+14 p. (Project no. 295-60-000).
AD 90 278 UNCLASSIFIED

Research conducted by the Personnel Research Branch, Department of the Army, in the following areas is summarized: induction and recruitment tests, screening of induction failures, selection of leaders, selection of helicopter pilots, selection of techniques for new weapons systems, civilian supervisors, tests for combat arms selection, classification tests for joint use by the Army,

Navy, and Air Force, visual measures, foreign language tests, standards of on-the-job utility and selection tests for marginal personnel, prediction of school success and job utility, use of insular Puerto Ricans, and military personnel opinions.

3729
Amico, G. V.
PREFACE TO SPACE FLIGHT: SYNTHETIC TRAINING. — Off. Naval Research, Research Rev., 1955 (Nov.): 15-20. DLC (Q180.U5A54, v. 1955)

Development of a space flight simulator is suggested for space pilot training and for evaluation of equipment design. The requirements and functions of the proposed device are briefly discussed.

3730
Ammons, R. B.
ROTARY PURSUIT APPARATUS. I. SURVEY OF VARIABLES. — Psychol. Bull., 52 (1): 69-76. Jan. 1955. DLC (BF1.P75, v. 52)

This is a critical survey of the adequacy of apparatus descriptions in rotary pursuit experimentation. Evaluation of 28 rotary pursuit studies in regard to 18 apparatus variables revealed a failure to specify the handling of more than half of these variables by any one of the researchers. Complete specification of the apparatus used in rotary pursuit is recommended, as some of the variables have a significant effect on performance.

3731
Ammons, R. B.
ROTARY PURSUIT APPARATUS. II. EFFECT OF STYLUS LENGTH ON PERFORMANCE. — Psychol. Reports, 1 (2): 103. June 1955. DLC (BF21.P843, v. 1)

The effect of the length of hinged section of stylus on rotary pursuit performance was explored and found to be nonsignificant.

3732
Anderson, N. H.,
F. H. Kresse, and D. A. Grant
EFFECT OF RATE OF AUTOMATICALLY-PACED TRAINING IN A MULTIDIMENSIONAL PSYCHOMOTOR TASK. — Jour. Exper. Psychol., 49 (4): 231-236. April 1955. DLC (BF1.J6, v. 49)

The results of an experiment testing the effect of rate of automatically-paced training in a multidimensional psychomotor task are presented. Nine conditions of automatic pacing were employed in addition to the self-paced control group. Six of the experimental groups were trained with constant pacing rates while the pacing rate for the remaining three experimental groups was increased in successive training trials. The results show that automatically-paced training is as efficient as self-paced training, even though there are fewer correct responses in the former groups. The comparable efficiency level is evident even when less time is spent in training than for self-paced subjects. Superior terminal performance of automatically-paced groups was demonstrated in this experiment. (From the authors' summary)

3733
Andjus, R. K.,
F. Knöpfelmacher, R. W. Russell, and A. U. Smith
EFFECTS OF HYPOTHERMIA ON BEHAVIOUR. — Nature (London), 176 (4491): 1015-1016. Nov. 26, 1955. DLC (Q1.N2, v. 176)

Rats whose body temperature had been lowered to 0-1° C. showed significant impairment in problem-solving performance after rewarming. No significant impairment was observed in animals cooled to 13-19° C. and rewarmed. No significant effect on retention of previous training, speed of locomotion, or amount of food intake was observed in either group.

3734
Andreas, B. G.,
D. F. Murphy, and S. D. S. Spragg
SPEED OF TARGET ACQUISITION AS FUNCTIONS OF KNOB VS. STICK CONTROL, POSITIONING VS. VELOCITY RELATIONSHIP, AND SCORING TOLERANCE. — Univ. of Rochester, New York, (Contract AF 30(602)-200); issued by Rome Air Development Center. Human Factors Office, New York. Scientific Report no. 3, July 1955. iii+20 p. AD 76 207 PB 125938

An experiment was performed to determine the speed of acquisition of single stationary targets by practiced subjects as a function of (1) two knob controls vs. a miniature stick control: (2) positioning vs. the velocity display-control movement relationship; and (3) large vs. small on-target tolerances. Three measures of performance were analyzed: movement time, settling time, and total time. The resulting performance curves showed improvement as a function of practice for velocity tracking over the first 4 or 5 trials, but relatively little improvement thereafter. Evidences of improvement for position tracking were slight. Results indicated that (1) the 2-knob control was significantly superior to the X-Y stick control; (2) superiority of the 2-knob control was greater for the smaller of the two on-target tolerances and was caused mainly by differences in settling time rather than movement time; and (3) position tracking was significantly superior to velocity tracking for large and small on-target tolerances, for knobs as well as stick control, and for movement time as well as settling time. (From the AD abstract)

3735
Andreas, B. G.,
R. F. Green, and S. D. S. Spragg
TRANSFER EFFECTS IN COMPENSATORY TRACKING RESULTING FROM REVERSAL OF THE DISPLAY-CONTROL RELATIONSHIP ON ALTERNATE BLOCKS OF TRIALS. — Univ. of Rochester. Dept. of Psychology, New York (Contract N6onr-241, Task Order 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L.I., New York. Technical Report no. SPECDEVCEN 241-6-21, Aug. 1, 1955. 8 p. (SPECDEVCEN Project no. 20-M-1d). AD 109 353 UNCLASSIFIED
Essentially the same published in: Jour. Psychol., 40 (2): 421-430. Oct. 1955. DLC (BF1.J67, v. 40)

Nine groups of military personnel were used as subjects; 7 groups were given practice on a compensatory tracking task with the display-control movement relationship alternated between a natural and an unnatural condition on alternate blocks of trials. The unnatural condition involves exactly the opposite relations of the natural condition between direction of crank rotation, and the movement of the controlled member and assumed movement of the crosshairs. Each subject was given 20 one-minute trials on the modified two-hand pursuit test. Performance with the natural display-control relationship was not adversely affected by interspersed trials with the unnatural condition; interspersed trials of natural practice had very little adverse effect in performance with the natural display-control relationship. Compensatory tracking showed less interference arising from reversed display-control relations than did following tracking. The sequence of conditions did not affect performance to any appreciable extent. (From the AD abstract)

3736
Angelino, H.,
and E. V. Mech
FACTORS INFLUENCING ROUTINE PERFORMANCE UNDER NOISE. II. AN EXPLORATORY ANALYSIS OF THE INFLUENCE OF "ADJUSTMENT". — Jour. Psychol., 40 (2): 397-401. Oct. 1955. DLC (BF1.J67, v. 40)

The relationship between personality measures and performance under noise was investigated. The 14 highest and the 14 lowest scores on the California Test of Personality, which had been administered to 150 students, were selected as test subjects. The mean total "adjustment" score for the low group was 108 points (20th percentile for adult series), for the high group 164 points (95th percentile). The subjects were tested individually on a routine arithmetical task, involving the addition of several one-digit numbers of a two-digit number, under quiet conditions and under noise (a continuous tone of approximately 85 db. intensity). The statistically significant superior performance of the "low adjustment" group under noise suggests the existence of an inverse relationship between "adjustment" and routine performance under the noise conditions employed.

3737
Angeluscheff, Z. D.
ULTRASONICS AND PROGRESSIVE DEAFNESS. — Acta oto-laryngologica (Stockholm), 45 (1): 7-13. Jan.-Feb. 1955. In English. DNLM

The chemical and structural damage produced in the ear by ultrasonic vibrations is described. The phenomenon is shown to derive basically from the migration of ions in response to electrokinetic potentials created by the vibration of the liquid of the cochlea. The effect is aggravated by the amplification, through microphones and similar devices, of the energy potential inherent in sound.

3738
Anthony, A.
EFFECTS OF NOISE ON EOSINOPHIL LEVELS OF AUDIOGENIC-SEIZURE-SUSCEPTIBLE AND SEIZURE-RESISTANT MICE. — Jour. Acoust. Soc. Amer., 27 (6): 1150-1153. Nov. 1955. DLC (QC221. A4, v. 27)

Mice susceptible to sound-induced seizures were exposed to 1-minute noise stimulations (110 db., 10-20 kc.) at a time in the diurnal rhythm when the eosinophil level was normally beginning to rise. A nearly identical marked eosinopenia was noted 3 hours later in mice never previously exposed to noise and in mice exposed previously for 30 days to brief noise bursts. Seizure-resistant mice showed only a slight eosinopenia after similar noise stimulation. In both groups, recovery was complete within 24 hours. A more prolonged eosinopenia was produced by several successive noise bursts. Again eosinopenia was more severe in seizure-susceptible mice, and was still present after nearly 24 hours. No damaging organic effects were seen in these animals, and it was concluded that noise stimulation was only a very mild stress.

3739
Anthony, A.,
and E. Ackerman
EFFECTS OF NOISE ON THE BLOOD EOSINOPHIL LEVELS AND ADRENALS OF MICE. — Jour. Acoust. Soc. Amer., 27 (6): 1144-1149. Nov. 1955. DLC (QC221. A4, v. 27)

Mice were exposed to intermittent 90 minute noise stimulation (10-20 kc. at 110 db.) continuously for 4 weeks or to daily 15 or 45 minute stimulations for 1 to 3 months. In continuously noise-exposed animals eosinophil counts made every other day showed a slight increase in eosinophil counts in active mice and a decrease in relatively quiet mice. In the second experimental condition, only the quiet mouse strain was employed and mice were kept separated to minimize activity. The level of eosinophils was consistently higher at the beginning of the daily noise stimulation. Eosinopenia was noted 3 and in some cases 6 hours later, however, while eosinophil levels in control mice were increasing. The adrenal glands of mice killed after 3 months of exposure showed a temporary hypertrophy 5 to 8 hours after noise stimulation, shown by an increase in adrenal weight and by increased sudanophilic staining of the fasciculate zone of the adrenal cortex. No pathological effects were noted in the testes, seminal vesicles, spleen, or thymus. Since no permanent damage was noted in mice exposed to noise stimulus, it is concluded that the eosinophil and adrenal changes observed were manifestations of a normal response to a sensory stimulus rather than of a response to a nonspecific stress or agent.

3740
Anthony, G. C.,
R. R. Dougan, and K. N. Satyendra
STUDY OF PILOT-ASSIST DEVICES FOR ARMY FIXED-WING LIAISON AIRCRAFT. — Westinghouse Electric Corp., Baltimore, Md. Quarterly Engineering Report no. 3, Feb. 16-April 15, 1955. 98 p. (Report no. ER-40-Q-TR202). AD 70 817
UNCLASSIFIED

A control stick and instrument panel mockup was fabricated to simulate L-19 flying conditions. Fourteen control device configurations were tested by investigating (1) load droop characteristics; (2) gust power spectral densities; (3) wind gust response, and (4) flyability and degree of aid furnished to pilot. Gains, stability, and steady-state load droop were determined for each system, and the correlation between the 4 testing methods were determined. An analytical representation for the nonlinear characteristics of a contractor servo was formulated, and a stability analysis of a representative control system employing such a servo in the inner loop was performed. Of the 4 evaluation methods used, only the statistical gust analysis and the flyability study produced results with high correlation. (AD abstract, modified)

3741
Applezweig, M. H.
MOTIVATION AND PSYCHOLOGICAL STRESS. — Connecticut College, New London, Dept. of Psychology (Contract Nonr 996(02). Interim Report, April 30, 1955. 6+11 p. (Project no. NR 172-228). AD 64 998 PB 124288

A new 59-item behavior-interpretation inventory form has been developed and is being administered to a subject population at the U.S. Naval Submarine Base. The new form represents an attempt to improve the reliability of earlier experimental forms by inclusion of items found to be most reliable in earlier studies and by ranking of alternative answers in order to produce a larger spread in scores.

3742
Armstrong, J. A.,
D. I. Fryer, W. K. Stewart, and H. E. Whittingham
INTERPRETATION OF INJURIES IN THE COMET AIRCRAFT DISASTERS: AN EXPERIMENTAL APPROACH. — Lancet (London), 268 (6875): 1135-1144. June 4, 1955. DLC (R31.L3, v. 268)
Also issued as: Flying Personnel Research Committee (Gt. Brit.), Report no. 920, 1955. 28 pp.

An experimental approach is presented to the interpretation of injuries incurred in two aircraft disasters (January 10 and April 10, 1954, on flights from Rome) by reconstructing the events from post-mortem evidence. The condition of the bodies recovered from the sea indicates that injuries were inflicted either in the aircraft, on impact with the sea, or while the bodies were floating in the water. It is assumed that head injuries, along with thoracic abrasions and fractures, were acquired within the aircraft, apparently resulting from an extremely violent upward and forward displacement of the seated occupants at the moment of initial failure. The nature of the internal injuries in the recovered bodies, including the pulmonary lesions usually due to explosive decompression, could not be identified; they were attributed to impact with the water surface. The etiopathogenesis and histopathology of skin and pulmonary lesions are discussed. (51 references)

3743
Arnould, P.,
M. LaMarche, and J. Jochum
[EFFECT OF CORTISONE ON RESISTANCE TO ANOXEMIA IN THE UNANESTHETIZED GUINEA PIG] Influence de la cortisone sur la résistance à l'anoxémie chez le Cobaye non anesthésié. — Comptes rendus de la Société de biologie (Paris), 149 (5-6): 557-559. March 1955. In French. DLC (QP1.S7, v. 149)

Guinea pigs were given intraperitoneally 2 mg. of cortisone per kg. of body weight and exposed one half hour later to a simulated altitude of 13,000 m. The administration of cortisone was found to increase the average time of appearance of primary apnea from 7.8 minutes to 23.57 minutes.

3744
Arslan, M.
ON THE RENEWING OF THE METHODOLOGY FOR THE STIMULATION OF THE VESTIBULAR APPARATUS: A DISCUSSION WITH CLINICAL AIMS. — Acta oto-laryngologica (Stockholm), Suppl. 122, 97 p. 1955. In English. DNLM

The methodology for the acceleratory and caloric stimulation of the vestibular apparatus is discussed. To eliminate variability in the measurement of vestibular function, physical quantification of vestibular stimuli and reactions is necessary. The following assumptions are made: (1) Quantitative measurement of physical vestibular stimuli is justified by the established relation between vestibular stimuli, physical modifications of the vestibular apparatus, and vestibular reflexes. (2) A test is desirable for a single reflex obtained with a standard stimulation sufficiently above threshold to produce a uniform response. (3) "Hypermaximal" stimuli (at a level at which reaction to degrees of stimulation cannot be distinguished) must be avoided. (4) Measurement of nystagmus is preferable to the determination of sensation of rotation of tonic asymmetry in the arms and body muscles. (5) The duration, number of jerks, frequency, slow component velocity and amplitude, quality of the fast and slow components, and phases of nystagmus must be measured. (6) Factors interfering with the nystagmus tested (retinal stimulation, changes in head position) should be eliminated. The Tönnies chair for vestibular stimulation by angular acceleration is described. The physiological basis for vestibular heat is discussed, and physical factors in the variation of the vestibular reaction are listed. Values for nystagmus produced by acceleration or heat obtained by various investigators are compared with values obtained with the Tönnies chair. (180 references)

3745
Aschan, G.
[THE EFFECT OF FLIGHT NOISES ON THE HUMAN ORGANISM] Flygbullrets inverkan på den mänskliga organismen. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (1): 15-19. 1955. In Swedish, with English summary (p. 19). DNLM

Distinction is made between the detrimental effects of noise on hearing and its nuisance quality. For the fighter pilots fire-arm shooting results in more hearing damage than flying, as long as the flying time does not exceed 4-5,000 flying hours. The use of ear defenders while exposed to

noise, including that of fire arms, is stressed for ground personnel. Little is known as yet about the psychological effects of noise. Many symptoms attributed to noise trauma are so common and diffuse that they might be explained by other factors. (Author's summary, modified)

3746
Aschoff, J.,
and J. Meyer-Lohmann
[THE ACTIVITY OF CAGED GREENFINCHES IN THE 24-HOUR DAY UNDER VARYING DURATION OF ILLUMINATION WITH AND WITHOUT DUSK] Die Aktivität gekäfigter Grünfinken im 24-Stunden-Tag bei unterschiedlich langer Lichtzeit mit und ohne Dämmerung. — Zeitschrift für Tierpsychologie (Berlin), 12 (2): 254-265. Nov. 1955. In German, with English summary (p. 264-265).
DLC (BF1.Z4, v. 12)

The locomotor activity of caged greenfinches shows a primary maximum in the morning and a secondary maximum in the evening. The primary maximum is an invariable constituent, while the secondary maximum fluctuates influenced by environmental clues. During a light period of 8 hours per day the greenfinch exhibits the highest activity per light-hour, during a light period of 12 hours per day the highest total activity per 24 hrs. Days of longer light periods show considerably less activity per light-hour; even the total activity per 24 hrs. may decrease. However, below a certain minimum activity per light-hour there is no further decrease. If the light period is shorter than 8 hours, the total activity per 24 hours decreases rapidly. The proportion of light hours to dark hours for the proper development and health of the animals is briefly discussed.

3747
Aschoff, J.
[TIMERS OF THE 24-HOUR RHYTHM] Zeitgeber der 24-Stunden-Periodik. — Acta medica scandinavica (Stockholm), Suppl. 307: 50-52, 1955. In German. DNLM

Assuming the existence of inherited or aqcuired endogenous components of the diurnal rhythm, it is supplemented by exogenous timers in the environment of the animal. The knowledge of these timers and their mode of functioning becomes a requirement for research on the endogenous components. Under natural environmental conditions the operation of several timers with a contest possibly between them has to be considered. The extent to which a biological clock is influenced by a timer varies with the accompanying external and internal conditions. The exclusion of the dominant timer may permit a less influential timer emerge to take over the function of the former. The chief timers are: daily variations in illumination, temperature, and humidity, as well as periodic stimuli from the socio-ecological environment of the animal. (Author's summary, modified)

3748
Aserinsky, E.
EFFECTS OF ILLUMINATION AND SLEEP UPON AMPLITUDE OF ELECTRO-OCULOGRAM. — A. M. A. Arch. Ophthalmol., 53 (4): 542-546. April 1955. DLC (RE1.A62, v. 53)

Dark and light adaptation of the eye significantly alter the amplitude of the electro-oculogram (EOG, record of eye movement based on the direct-current potential of the eye), but the changes do not appear to parallel the temporal course of retinal adaptation. The EOG amplitude of the dark-adapted eye decreases with subsequent testing under the conditions of alternating light and dark adaptation trials. Sleep may increase the EOG amplitude above a presleep minimum level, but it is not known whether this effect is due entirely to a diurnal increase of eye-movement velocity or to an increase of the direct-current potential of the eye. Interpretation of the results of other investigations are discussed in view of the possible variability of the EOG as a result of changes in the magnitude of the resting potential of the eye. Interpretation of the results of other investigations are discussed in view of the possible variability of the EOG as a result of changes in the magnitude of the resting potential of the eye which occurred unintentionally. (Author's summary)

3749
Asher, J. W.,
T. D. Hanley, and M. D. Steer
A FIELD STUDY OF VOICE COMMUNICATION PROBLEMS AS RELATED TO TRAINING DEVICES, PROCEDURE AND EQUIPMENT. — Purdue Univ., Lafayette, Ind. (Contract N6ori-104); issued by Office of Naval Research. Special Devices Center, Port Washington, N. Y. Technical Report no. SPECDEVCEN 104-2-41, April 13, 1955. 3+43 p. AD 75 348 UNCLASSIFIED

An opinion survey was conducted of Naval personnel charged with communications duties, including senior officers, communications officers, and enlisted personnel. Responses indicate that the following critical areas should be considered for improving voice communications systems: (1) the kind and/or amount of voice communications training; (2) development and utilization of a voice communications training device; (3) standardization of communications procedures; and (4) design of communications equipment for greater power, fidelity, and functional efficiency.

3750
Asmussen, E.,
and M. Nielsen
THE CARDIAC OUTPUT IN REST AND WORK AT LOW AND HIGH OXYGEN PRESSURES. — Acta physiologica scandinavica (Stockholm), 35 (1): 73-83. 1955. In English. DNLM

Cardiac output during 12 or 100% oxygen breathing was determined by the dye injection method. During low-oxygen breathing, an increase of 10 to 20% in cardiac output at rest and at work was associated with an increase in pulse rate and a slight decrease in stroke volume. High-oxygen breathing caused a decrease in pulse rate of 4 to 8%, but had no effect on cardiac output.

3751
Assmann, D.
[THE WEATHER SENSITIVITY OF MAN: CAUSES AND PATHOGENESIS OF THE BIOLOGICAL EFFECT OF WEATHER] Die Wetterfühligkeit des Menschen: Ursachen und Pathogenese der biologischen Wetterwirkung. — vii+182 p. Jena: Gustav Fischer Verlag, 1955. In German.
DLC (QP82.A79)

A brief discussion is presented of the direct and indirect biological effects of meteorological phenomena such as natural rhythms, air pressure, temperature, humidity, clouds, rain, sunshine, wind, atmospheric electric charge, storms, cosmic rays, and radioactivity. Methods for determining the relationship between weather and biological phenomena are reviewed, and hypotheses concerning the mechanism of the relationship are briefly considered. A detailed discussion of the physiological and biochemical effects of changes in atmospheric oxygen content is presented. 301 references.

3752
Åström, A.
[THE EFFECT OF ACCELERATION STRESS ON THE HUMAN BODY] Inverkan på människokroppen av accelerationspakänningar. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (3): 22-23. 1955. In Swedish. DNLM

The effects of prolonged (more than 2-3 sec.) radial acceleration (over 2 g) on the human reflexes and the higher nervous centers are discussed, as they result in motor disturbances; grey-out, black-out, and syncope due to reduced blood supply to the cerebrum; fatigue; and disorientation. Under these conditions the reaction time and efficiency of the pilot are reduced. He is liable to misread the instruments or misjudge situations. Following black-outs the capacity to react is extremely reduced for at least 15-30 sec. The present-day anti-g protection equipment is considered inadequate for future aircraft. Further research on placing the pilots in a horizontal position is advocated since in this position their acceleration tolerance is raised to 12-15 g.

3753
Åström, A.
[OPINIONS ON THE RESCUE FROM HIGH ALTITUDES] Synpunkter på räddning från höga höjder. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (3): 18-21. 1955. In Swedish. DNLM

The author discusses aeromedical problems arising from rapid drops in atmospheric pressure, i. e. during ascent and flight at 15,000 to 20,000 m. altitude. The primary effects include mechanical effects on the lungs; expansion of gas volume enclosed in sinuses, middle ear, and intestines; gas bubble formation (causing bends, chokes, etc.), and anoxia. Characteristics of the main types of overpressure equipment (vest, anti-g suits, capstan suits, full pressure suits) are outlined. Equipment designed to protect the pilot after explosive decompression should feature automatic actuating devices due to the short time span of 11-15 sec. between decompression and black-out. A diagram is presented showing the variation in pulmonary gas pressure between 0 - 20,000 m. altitude during air breathing and during 100% O_2 respiration. The design requirements for protective equipment for ejection at high altitudes are discussed. The catapult equipment, face protection, tumbling after ejection, and the low temperatures at high altitude and on the ground pose the major problem in addition to the pressure differential between the cockpit and the outside.

3754
Atkinson, C. J.
AN ESTIMATE OF THE SPECTRUM OF BODY-CONDUCTED SIDETONE FOR THE VOWEL [i]. — State Univ. of Iowa, Iowa City (Contract no. DA-36-039 sc-63144). Supplementary Report no. 3, Sept. 30, 1955. iv+32 p. AD 75 100
UNCLASSIFIED

An attempt to estimate the spectrum of bone-conducted sidetone was made by determining threshold shifts for air-conducted pure tones immediately after phonation (with airborne sound isolated) by subjects at selected frequency levels. In a preliminary study several vowels tested at vocalization levels from 75 to 85 db. were found to produce similar threshold shifts. The vowel (i - heat), vocalized at a sound pressure level of 90 db. and at a frequency of 130 c.p.s., caused a threshold shift of approximately 20 db. at frequencies from 100 to 600 c.p.s., and a slightly lower shift from 1000 to 3000 c.p.s. An increase in duration of the test tone from 80 to 170 milliseconds in general produced a decrease in threshold shift. Threshold shifts comparable to those produced by (i) vocalization at 90 db. were produced by random noise at 44-54 db. for frequencies of 100 to 2000 c.p.s., and less than 29 db. for frequencies of 4000 and 8000 c.p.s. It is concluded that the spectrum of bone-conducted sidetone bears little resemblance to the airborne spectrum of sound.

3755
Attneave, F.
PERCEPTION OF PLACE IN A CIRCULAR FIELD. — Amer. Jour. Psychol., 68 (1): 69-82. March 1955.
DLC (BF1.A5, v. 68)

Sixty-four observers (airman basic trainees) were required to reproduce from immediate memory, the positions of single points presented on a homogeneous circular screen in the frontal plane. A total of 91 different positions within the circle were thus explored. In addition to objective landmarks (circular border of the field), the observers utilized certain subjective landmarks, namely, the vertical and horizontal diameters of the screen. Both objective and subjective landmarks exerted the following effects on errors: (1) variable errors (i.e. the interquartile range of responses), taken along an axis oriented toward a given landmark, tended to decrease in the vicinity of the landmark inaccordance with Weber's law, and (2) constant errors were consistently directed away from nearby landmarks. (Author's summary, modified)

3756
Attneave, F.
SYMMETRY, INFORMATION, AND MEMORY FOR PATTERNS. — Amer. Jour. Psychol., 68 (2): 209-222. June 1955. DLC (BF1.A5, v. 68)

Three experiments investigating the effect of symmetry on memory for patterns are reported. The recall conditions were immediate reproduction, delayed reproduction, and identification, respectively. As stimulus-objects were presented patterns of dots in rectangular matrices, varied in such a way as to permit comparison between memory for symmetrical patterns and memory for (a) asymmetrical patterns with the same informational content ---hence fewer cells, and (b) asymmetrical patterns occupying the same number of cells, hence containing more information. In none of these experiments were symmetrical patterns easier to remember than asymmetrical patterns with the same informational content; in the first two experiments they were significantly more difficult. In all of them symmetrical patterns were remembered more easily than asymmetrical patterns occupying the same number of cells. Random patterns were found in all cases to be more difficult the greater their complexity, i.e. the more cells they occupied. The results are related to the Gestalt concept of "figural goodness" and to information theory. (Author's summary, modified)

3757
Auerbach, E.,
and G. Wald
THE PARTICIPATION OF DIFFERENT TYPES OF CONES IN HUMAN LIGHT AND DARK ADAPTATION. — Amer. Jour. Ophthalmol., 39 (2): 24-39. Feb. 1955. DNLM

Following adaptation to very bright white or colored lights, dark adaptation of the cones displays inflections and changes in color sensation that seem to have their source in the retina. Striking changes in color sensation are experienced also during and immediately after adaptation to very intense red or blue lights. After exposure of the eye to intense orange-to-red light, the first few minutes of dark adaptation measured at short wave lengths, are occupied with a receptor maximally sensitive to violet light, and whose excitation induces violet or blue sensations. The violet receptor is present in the central fovea. It is present also in protanopes and deuteranopes, together perhaps with only one other type of cone. Measurement in the far peripheral retina (90° from the fovea) show cone function to be present, and reveal a condition resembling protanopia, though no color sensations are experienced. (Authors' summary, modified)

3758
[Aury, G.] 1954
SEA WATER DRINKING AND SURVIVAL AT SEA. — Royal Naval Personnel Research Committee (Gt. Brit.). 34 p. June 1954. AD 76 605
UNCLASSIFIED

A translation is presented of an account of experiments conducted for the French Naval Air Service by G. Aury, Principal Medical Officer of the Scientific Section of the French Naval Headquarters. Twelve volunteers existed on half a liter of sea water per day (in some cases supplemented with survival rations) for periods of 2, 3, and 4 days on floating life rafts. The subjects who drank the sea water in measured doses from the first hour of the experiments did not experience thirst and felt no particular discomfort in connection with their diet. Numerous biological and chemical tests carried out on blood and urine during the exposure period (detailed data are given) indicated that the large intake of salt caused only a slight effect on homeostasis and that a ration of one and a half liters of fresh water on the fifth day was sufficient to reestablish chloride equilibrium.

3759
AVIATION MEDICAL ACCELERATION LABORATORY, JOHNSVILLE, PENNSYLVANIA. — U. S. Navy Med. News Letter, 25 (4): 19-20. Feb. 18, 1955. DNLM

Research in aviation medicine utilizing the human centrifuge at the Aviation Medical Acceleration Laboratory, Johnsville, Pa., deals primarily with: (1) studies on the pilot's ability to actuate controls in high performance aircraft, or in event of emergencies such as are encountered in an uncontrolled aircraft; (2) tolerance to acceleration stress as is encountered in high performance aircraft in flight; (3) in the event of bail-out, studies on deceleration, hitting the air stream, the ram pressure of air, the opening shock of the parachute and anoxia and frostbite; (4) tolerance to acceleration such as may be encountered in launching of high-performance aircraft from carrier decks; (5) recovery of aircraft with high landing speeds in the limited deck space, and (6) protection of pilot, deck crew, and bridge personnel from high intensity noises.

3760
AVIATION MEDICINE SPECIALTY TRAINING PROGRAM. — U. S. Air Force Medical Service Digest, 6 (5): 16-18. May 1955. DLC

The Revised Aviation Medicine Specialty Training Program of the U. S. Air Force is described in regard to its objectives, different phases of training, prerequisites to be met by the applicants, and application.

3761
AVIATION PHYSICAL STANDARDS AND THE GENERAL PHYSICAL EXAMINATION. — In: Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 191-219. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

The general provisions and standards for aviation physical examinations are presented (as taken from Chapter 15, Section V, of the Manual of the Medical Department, United States Navy. Washington, 1952).

3762
Bacq, Z. M.,
Y. Cuypers, E. Evrard, and R. Soetens
[ACTION OF CYSTAMINE ON THE RESISTANCE OF THE RAT TO DECOMPRESSION] Action de la cystamine sur la résistance du Rat à la dépression barométrique. — Comptes rendus de la Société de biologie (Paris), 149 (21-22): 2014-2017. Nov. 1955. In French. DLC (QP1.S7, v. 149)

Rats were exposed to a simulated altitude of 10,600 m. (178 mm. Hg) 30 minutes after intraperitoneal administration of cystamine. The mor-

tality rate of these animals reached 100% within 60 minutes, with an average survival time of 34 minutes, while 14 of 18 untreated animals survived 90 minutes of hypoxia. The action of cystamine is not attributed to release of histamine, the injection of which decreases survival time, since the administration of both cystamine and an antihistaminic did not increase the survival rate. Its action is therefore attributed to a slowing of the blood circulation.

3763
Bahrick, H. P.,
W. F. Bennett, and P. M. Fitts
ACCURACY OF POSITIONING RESPONSES AS A FUNCTION OF SPRING LOADING IN A CONTROL. — Jour. Exper. Psychol., 49 (6): 437-444. June 1955. DLC (BF1.J6, v. 49)

This study investigated accuracy of positioning a horizontal arm control as a function of changes in the torque-displacement relation of the control. It was found that positioning errors were smallest when the ratio of relative torque change to displacement is largest, particularly if the absolute change of torque with displacement is also large. It is concluded that control forces opposing a movement can provide useful cues in learning to execute different amplitudes of movement, and that their usefulness depends upon the relative and absolute torque change per unit of control motion. (Authors' summary)

3764
Bahrick, H. P.,
P. M. Fitts, and R. Schneider
REPRODUCTION OF SAMPLE MOVEMENTS AS A FUNCTION OF FACTORS INFLUENCING PROPRIOCEPTIVE FEEDBACK. — Jour. Exper. Psychol., 49 (6): 445-454. June 1955. DLC (BF1.J6, v. 49)

This study tested the hypotheses that elasticity added to a control should lead to improved spatial accuracy of movements, while damping and mass added to a control should lead to improved temporal accuracy of movement. To test these hypotheses subjects performed simple circular and triangular control motions with a joy stick when the control was loaded with various degrees of spring stiffness, or damping, or mass. Three levels of each control parameter were equated originally by means of a psychophysical procedure so that movements opposed by each of the three physical factors were judged by subjects to involve equal effort. Increase in damping and mass resulted in reduction of temporal variability in support of the proposed hypothesis regarding the utilization of proprioceptive information. Increasing the degree of spring stiffness did not significantly improve spatial accuracy of movement. (Authors' summary, modified)

3765
Bair, J. T.,
and R. K. Ambler
ATTRITION DATA AS A CRITERION. III. MEDICAL ATTRITIONS WITH ANXIETY SYMPTOMS. — In: Research notes from the Aviation Psychol. Lab., p. 5-8. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 109 100.08, March 15, 1955. AD 74 676 UNCLASSIFIED

A group of cadets exhibiting anxiety symptoms was identified by analysis of interview records from a group of 63 cadets dropped for medical reasons from the Naval Air Basic Training Program. The Flight Aptitude Ratings and Pre-Flight academic grades of the anxiety group were found to be significantly lower than those of a group of successful cadets and those of other unsuccessful cadets not showing anxiety. Similarities in flight aptitude, academic grades, and anxiety attitude toward flying between the anxiety medical attrition group, a total flight failure group, and a voluntary withdrawal group indicate that these groups may be combined in a total attrition group for evaluation purposes.

3766
Baisinger, L. F.
VISUAL FIELD TESTING WITH BINOCULAR FIXATION. — Amer. Jour. Ophthalmol., 39 (4): 566-567. April 1955. DNLM

A method is presented permitting rapid testing of the monocular vision field with greater accuracy by means of binocular fixation. The equipment required is simple and inexpensive.

3767
Bakan, P.
DISCRIMINATION DECREMENT AS A FUNCTION OF TIME IN A PROLONGED VIGIL. — Jour. Exper. Psychol., 50 (6): 387-390. Dec. 1955. DLC (BF1.J6, v. 50)

Vigilance decrement during a prolonged vigil was measured by a method of repeated threshold measurement. Twenty subjects were tested individually for 1½ hours on each of two days. The subject had to respond to brighter flash stimuli substituted for the standard flash stimulus at predetermined times. Test stimuli in the range of 3.2 ft.-L to 4.0 ft.-L were arranged in a series of equal log steps. The method of limits was employed to measure threshold of response to the test stimuli. The extent to which the difference in brightness between the standard and the variable was increased to elicit a response, was taken as a measurement of vigilance decrement. This decrement in vigilance is attributed to the subject's attempt to change a monotonous situation psychologically, e.g., by daydreaming, which reduces attention to the task.

3768
Baker, H. D.
SOME DIRECT COMPARISONS BETWEEN LIGHT AND DARK ADAPTATION. — Jour. Optical Soc. Amer., 45 (10): 839-844. Oct. 1955. DLC (QC350.Q6, v. 45)
Reprint issued also as: Florida State Univ., Tallahassee. Technical Report, June 7, 1955. [Contract Nonr-55800]. AD 61 623 UNCLASSIFIED

In testing absolute visual threshold and difference threshold it has been found that the two measures are related, the difference threshold approaching and finally including the absolute threshold at low luminances. The relationship indicates that both

the absolute threshold and the difference threshold are limited by photochemical conditions in the visual receptor during dark adaptation, and after complete light adaptation to any luminance level. During light adaptation the absolute threshold reflects photochemical conditions but the difference threshold does not. It is suggested that this is because the difference threshold is affected by the near-maximum response of the visual receptor during early light adaptation. (Author's abstract, modified)

3769
Baker, P. T.,
R. F. Byrom, F. Daniels, and E. H. Munro
RELATIONSHIP BETWEEN SKINFOLD THICKNESS AND BODY COOLING AT 59° F. — Quartermaster Research and Development Center. Environmental Protection Division, Natick, Mass. Technical Report no. EP-14, July 1955. iv+22 p. AD 68 008
UNCLASSIFIED

Thirty-one men were exposed to an ambient temperature of 59° F. (15° C.) for two hours. They wore only shorts and were seated for the total period. Fat, as measured by skinfold calipers, bore a strong relationship to both rectal and skin temperatures. The greater the percentage of body fat, the lower the skin temperatures. The difference between one and 10 percent body fat made a difference of 5.9° F., in the minimum mean weighed skin temperature. The correlation between minimum rectal temperature and percent of fat was high: the fattest men maintained near normal rectal temperatures, while the thinnest men had rectal temperatures 1.2° F. lower. The examination of stature and fat-free weight correlations indicated that the primary relationship of fat to rectal temperature was modified by variations in body surface area. Fat men, at least while inactive and wearing only shorts, maintain internal body temperature at a more normal level than thin men, but fat men have lower skin temperatures. This can be interpreted as indicating that subcutaneous fat is acting as an effective insulator. (Authors' abstract, modified)

3770
Ballentine, D.
FOIL PACK MEAL GUIDE (INCLUDING RECIPES AND ASSOCIATED EQUIPMENT). — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-183, April 1955. v+47 p. (Project no. 6331). AD 740 90 UNCLASSIFIED

Recipes have been developed on an individual foil-pack basis specifically geared to the special problems in foil packaging and subsequent cooking in aircraft B-4 ovens. Food preparation directions are explained in detail with emphasis on food proportions, and optimum cooking times for cooking aloft during the 30-minute cooking cycle of the B-4 oven. Applications of an undented foil pack was found to be an improvement for foods which would otherwise scorch in B-4 oven cooking; this pack proved to be a necessity in developing acceptable eggs for breakfast. In addition, preliminary ordering guides for foods, preparation implements, foil packs, and accessories are included. Fifty lunch or dinner menus plus ten breakfast menus are incorporated. (Author's abstract, modified)

3771
Balzer, E.,
and K. Werner
[ON THE RHYTHM OF ENZYME SECRETION OF THE EXOCRINE PANCREAS] Zur Rhythmik der Fermentsekretion des exokrinen Pankreas. — Acta medica scandinavica (Stockholm), Supplement 307: 124-131. 1955. In German. DNLM

Three distinct rhythms were shown in the secretion of pancreatic enzymes. These rhythms are not diurnal in character nor dependent upon vagus stimulation, nor on the release of secretin hormone. Experimental stimulation of the vagus with pilocarpine, or injections of secretin did not affect the rhythm of enzyme secretion.

3772
Bancroft, R. W.,
and S. S. Wilks
DYNAMIC THORACIC PRESSURE-VOLUME RELATIONSHIPS WITH MASK AND TANK RESPIRATORS. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-24, April 1955. 8 p. AD 72 645
PB 118701

Thoracic pressure-volume relationships were determined during intermittent mask and tank pressure breathing by measuring simultaneously the esophageal and mask pressures, the tidal volumes, expiratory reserves, and vital capacities to compare the physiological characteristics of the two pressure breathing methods. Thoracic pressure-volume diagrams show that the thoracic pressure breathing are similar. These thoracic pressures in relation to the rest of the body are discussed from the standpoint of pressure gradients between the head and thorax. It can be postulated that an adverse pressure gradient is created during mask pressure breathing between the entire body and the thorax, but that during pressure breathing in a full-body respirator a physiologically favorable pressure gradient is maintained between the head and thorax. (Authors' summary)

3773
Bancroft, R. W.,
E. T. Carter, and U. C. Luft
EVALUATION OF THE HYPOXIA WARNING DEVICE. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-60, May 1955. 5 p. AD 69 864 PB 118516

A photoelectric hypoxia warning device was tested for reliability in the decompression chamber. The arterial oxygen saturation, as calculated from alveolar gas samples at the time of warning during acute hypoxic exposures, was used as the criterion for evaluating the device. The results indicated that under carefully controlled laboratory conditions the warning device tended to function consistently, but that further modifications in the photoelectric ear unit and in the amplifier and relay circuits are necessary before it can be considered suitable for testing under operational flying conditions. (Authors' abstract, modified)

3774
Bancroft, R. W.
INTRA-ABDOMINAL PRESSURE RELATIONSHIPS IN THE ANESTHETIZED DOG DURING RAPID DE COMPRESSION. — School of Aviation Medicine,

Randolph Field, Tex. Report no. 55-102, Oct. 1955.
AD 92 257 UNCLASSIFIED
Abstract published in: Federation Proceedings, 14 (1, part 1): 7-8. March 1955.
DLC (QH301.F37, v. 14)

In order to determine the increase in abdominal pressures and the possible effect on the circulation, the gastric, abdominal vena caval, and arterial pressures were measured simultaneously in dogs during and following rapid decompressions to simulated altitudes of 45,000 to 72,000 feet. It was found that gastric pressures increased during the decompressions, the greatest increases occurring at the most extreme altitudes. After a few seconds at these peak altitudes the gastric pressure tended to decline. On the other hand, the abdominal venous pressures were relatively unaffected during the rapid decompressions to altitudes below 62,000 feet, but increased following the decompressions, coinciding with a drop in arterial pressure. With decompressions to altitudes above 62,000 feet the abdominal venous pressure increased rapidly both during and following the decompressions, again coinciding with an almost immediate drop in arterial pressure. The increased gastric pressure during decompression appeared to have little effect on the systemic circulation compared to the overwhelming effect of anoxia and possibly water vapor pressure in the vena cava at extreme altitudes above 62,000 feet. (Author's summary)

3775
Barbashova, Z. I.
[EFFECT OF ADAPTATION TO HYPOXIA ON THE COURSE OF RADIATION DISEASE] Vliianie akklimatizatsii k gipoksii na techenie luchevoĭ bolezni. — Doklady Akademii nauk SSSR (Moskva), 101 (20): 379-381. March 1955. In Russian.
DLC (AS262.S3663, v. 101)

The purpose of the study was to determine whether preliminary adaptation of animals to chronic oxygen deficiency had any preventive or ameliorating effect on radiation disease. White mice were used in the tests. Adaptation to hypoxia was developed by keeping the mice in a decompression chamber at a pressure of 480 mm. Hg for six hours daily over a period of one month. Twenty-four hours after the last adaptation step the mice were exposed to Co^{60} γ-ray irradiation as described. Recorded observations indicated that preliminary adaptation to hypoxia by the method described lowered the mortality of the irradiated mice, slowed the rate of body weight loss, and mitigated the severity of the disease.

3776
Barbashova, Z. I.
[EFFECT OF ACUTE HYPOXIA ON THE ORGANISM'S RESISTANCE TO IONIZING RADIATION] Vliianie ostroĭ gipoksii na rezistentnost' organizma k ioniziruiushchemu izlucheniiu. — Doklady Akademii nauk SSSR (Moskva), 102 (4): 1219-1221. 1955. In Russian. DLC (AS262.S353, v. 102)

A study was made of changes in the organism's reactions to penetrating radiation in the presence of experimental hypoxia elicited immediately before or after irradiation. Two sets of experiments were performed: in one 29 young sexually mature white mice were exposed to reduced atmospheric pressure corresponding to 8000 m. altitude for 10 minutes and then irradiated. In the second series 28 white mice were daily irradiated first and then placed into the decompression chamber at a pressure equivalent to an altitude of 6000 m. Irradiation was made with Co^{60} for three hours over two months. In either experiment irradiation temporary hypoxia not only failed to alleviate the severity of the radiation disease, but considerably aggravated it. The negative hypoxia effect was greater in the mice irradiated with the γ-rays prior to being subjected to hypoxia.

3777
Bardález Vega, A.
[SOME CASES OF ACUTE PULMONARY EDEMA CAUSED BY SEVERE ALTITUDE SICKNESS] Algunos casos de edema pulmonar agudo por soroche grave. — Anales de la facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Peru), 38 (2): 232-243. 1955. In Spanish.

Seven fatal and nonfatal cases are reported of acute pulmonary edema caused by severe altitude sickness in Peruvian natives living at high altitude. Subjects with pronounced tachycardia, decreased arterial pressure and embryocardia, and with reduced body efficiency responded to oxygen therapy in combination with digitalis. Subjects with less pronounced tachycardia, good arterial pressure, and less pronounced body efficiency responded to oxygen therapy alone.

3778
Bargeton, D.
[COLD ADAPTATION BY THE RAT] L'adaptation au froid chez le rat. — Revue de pathologie générale et comparée (Paris), 55 (669): 915-920. June 1955. In French, with English summary (p. 919) DNLM

Rats exhibited a rapid rate of adaptation to prolonged cold exposure. A higher central temperature was noted along with an increase in energy expenditure.

3779
Bargeton, D.
[ADAPTATION TO COLD: LONG TERM REACTIONS OF THERMOREGULATION] L'adaptation au froid: réactions à long terme de la thermorégulation. — Archives des sciences physiologiques (Paris), 9 (4): C47-C59; discussion, p. C59-C62. 1955. In French. DNLM

Examples of the thermoregulatory mechanism of adaptation to prolonged cold exposure are described, including the increase in the basal metabolism of rats exposed to cold and the development of adipose tissue and fur in dogs and rabbits. Demonstration of a physiologic, rather than racial, adaptation to cold in man is complicated by the use of protective clothing and shelter, and has been accomplished only for the extremities.

3780
Barron, C. I.,
and A. A. Love
EVALUATION OF AUDIOMETRIC AND HEARING

STANDARDS IN INDUSTRY. — Indus. Med. and Surg., 24 (9): 398-405. Sept. 1955.
DLC (RC963.A37, v. 24)

A review is presented of a hearing conservation program in the aircraft industry, with detailed information concerning the establishment and effectiveness of audiometric and hearing standards. These standards permit uniform interpretation and classification of large numbers of audiometric examinations, with a minimum of direct supervision. Specially trained nurse-audiometrists were employed during the program. Pre-employment or placement standards are categorized as follows: acceptable for employment in noisy areas; unacceptable for placement in noise above 85 decibels; acceptable in noisy areas but not where deafness would constitute a hazard; and unacceptable for placement in areas of excessive noise or where deafness would constitute a hazard. Applicants accepted for employment in a noisy job are re-examined at regular and pre-determined intervals and categorized according to standards related to significant audiometric changes.

3781
Barron, C. I.,
and T. J. Cook
EXPLOSIVE DECOMPRESSION IN ALTITUDE TRAINING OF CIVILIAN AIR CREWS. — Jour. Aviation Med., 26 (1): 46-55. Feb. 1955.
DLC (RC1050.A36, v. 26)

A total of 234 subjects were subjected to explosive decompression from 8,000 to 25,000 feet; another group of 27 underwent decompression from 8,000 to 20,000 feet in less than 1 second. Subjects ranged from 20 to 55 years of age; the majority were in their forties, and approximately 20% had physical defects. Decompression was accomplished by stabilizing one cell of the pressure chamber at 8,000 feet, evacuating the companion cell to a simulated altitude of 20,000 or 25,000 feet, and then rupturing the diaphragm between them. A loud explosion occurred and the pressure in the cell which was stabilized at 8,000 feet underwent a rapid drop; temperature fell a maximum of 71° F. in less than two seconds. Condensation of water vapor and heavy fogging followed immediately; air disturbance due to passage of the sound wave was readily apparent; the desired simulated altitude was invariably attained within 0.7 second. A short period of confusion was recognized by 20% of the subjects; this period lasted 1-2 seconds and did not incapacitate anyone. Minor physical disorders which were present in some of the subjects were not aggravated by the decompression. Slight thoracic and abdominal expansion was felt by some, and two ruptured eardrums apparently resulted.

3782
Barron, C. I.,
A. A. Love, and A. A. Baraff
PHYSICAL EVALUATION OF PERSONNEL EXPOSED TO MICROWAVE EMANATIONS. — Jour. Aviation Med., 26 (6): 442-452. Dec. 1955.
DLC (RC1050.A36, v. 26)

Physical examinations were given to 226 subjects with histories of exposure (ranging from an occasional beam to 4 hours per day, for as long as 13 years) to radar microwave emanations. Eighty-eight nonexposed subjects were used as controls. The examination emphasized those structures with poor heat regulatory mechanics (cornea, gastrointestinal and genito-urinary tracts) and those organs and systems adversely affected by heat (gonads and hematopoietic system). A decrease in polymorphonuclear cells and an increase in monocytes and eosinophils were observed in the exposed group, but the significance of these changes was not determined. All but one of the pathologic conditions revealed by ocular examinations were found to be entirely unrelated to radar exposure. A majority of the subjects complained of a heating sensation when near X band antennas, and buzzings when near S band antennas. Occasional complaints of fatigue, headaches, and aching eyeballs were elicited.

3783
Barron, F.
THE DISPOSITION TOWARD ORIGINALITY. — Jour. Abnormal and Social Psychol., 51 (3): 478-485. Nov. 1955. DNLM

This research was directed toward the identification of individuals who perform consistently in a relatively more or relatively less original manner. The subjects were 100 U. S. Air Force captains. Originality was assessed in terms of uncommonness or response to eight tests, while still adequate to the reality of the test situation. There were significant intercorrelations among the eight tests and with an over-all staff rating of Originality based on observation of the subjects through three days of social interaction. Two groups of subjects, the regularly original and the regularly unoriginal were defined. Originality was found to be related to independence of judgment, to personal complexity, and to preference for complexity in phenomena, to self-assertion and dominance, and finally to the rejection of suppression as a mechanism for the control of impulses. (From the author's summary)

3784
Barron, F.
THRESHOLD FOR THE PERCEPTION OF HUMAN MOVEMENT IN INKBLOTS. — Jour. Consulting Psychol., 19 (1): 33-38. Feb. 1955.
DLC (BF1.F575, v. 19)

A series of 26 ink blots was preselected and arranged according to the known relative frequency with which an interpretation of a human movement (M response) was elicited. The correlates of M threshold were studied in a sample of 100 military officers who took part in three days of living-in assessment, and who had been described by staff psychologists through the use of Q-sort and adjective checklist techniques. M threshold was uncorrelated with measures of intelligence, originality, and associational fluency, but the subjects who displayed considerable readiness to give human movement responses were considered by staff psychologists to be more intelligent, inventive, introspective, contemplative, and the like. The conclusion was that the human movement tendency is a stylistic variable, which relates to a preference for "intrapsychic living" as opposed to interest in action, practical affairs, and "the world outside." (Author's summary, modified)

3785
Bartalena, G.
[EFFECT OF SYNTHETIC ANTIHISTAMINIC ON THE EFFECTS OF VESTIBULAR STIMULATION (EXPERIENCE WITH DIPHENHYDRAMINE)] Azione degli antistaminici di sintesi sugli effetti della stimolazione vestibolare (esperienze con difenidramina). — Bolletino delle malattie dell' orecchio della gola del naso di tracheo-bronco--esofagoscopia e di fonetica (Firenze), 73 (5): 500-512, Sept.-Oct. 1955. In Italian, with English summary (p. 511) DNLM

Persistent nystagmus was induced in twenty-one subjects by rotatory stimulation (Barany test) and by caloric stimulation (Veits test of injecting 10 cc. of water at 20°C. in the auditory canal). Benadryl (diphenhydramine) administered prior to the induction of nystagmus decreased the vestibular reaction. The higher the dosage the lower the reaction. The effect of Benadryl on the vestibular apparatus is related to several peripheral and central reactions that modify the function of the neurovegetative system. (From the author's summary)

3786
Bartels, H.,
H. P. Koepchen, I. Lühning, M. Mochizuki, and I. Witt
[THE ALVEOLAR-ARTERIAL O_2 PRESSURE DIFFERENCE IN REST AND WORK UNDER HYPEROXIA (50% O_2)] Die alveolär-arterielle O_2-Druckdifferenz bei Ruhe und Arbeit unter Hyperoxie (50% O_2). — Pflügers Archiv für die gesamte Physiologie (Berlin), 261 (6): 535-542. 1955. In German. DLC (QP1.A63, v. 261)

Fourteen subjects breathing 50% O_2 through a spirometer during moderate exercise showed a six-fold increase over resting values in O_2 turnover and consumption, and lesser increases in expiratory minute volume, respiratory frequency, and tidal volume. A 73% increase in the alveolar-material O_2 pressure difference was similar to that occurring in subjects breathing air during exercise. Since the shorter alveolar-arterial O_2 diffusion time under hyperoxia did not decrease the pressure difference found in air breathing, it is concluded that the time of alveolar-arterial O_2 contact in air breathing during exercise is sufficient for gaseous exchange.

3787
Bartless, R. G.
PROGNOSTIC PHYSIOLOGICAL CHANGES DURING THE PRODUCTION OF IMMERSION HYPOTHERMIA [Abstract]. — Federation Proceedings, 14 (1[1]): 10. March 1955. DLC (QH301.F37, v. 14)

Studies of hypothermia at body temperatures below 25° C. were made on rabbits, cats, and dogs. Certain physiologic changes occurring in the early stages of hypothermia indicate the nature of the changes which occur later at lower body temperatures, and also the approximate body temperature at which death will occur. Analysis of the changes in heart rate, blood pressure, respiratory rate, and oxygen consumption with decreasing body temperature indicates that those animals which live to the lowest body temperatures have a lesser depression (at all body temperatures) of these physiologic parameters than those animals which die early in hypothermia. Cats and especially dogs at lower body temperatures are prone to ventricular fibrillation. (From the Author's abstract)

3788
Bartlett, R. G.,
V. C. Bohr, and W. I. Inman
RELATIONSHIP OF OXYGEN CONSUMPTION TO BODY TEMPERATURE IN THE RESTRAINED RAT. — Canad. Jour. Biochem. and Physiol. (Ottawa), 33 (4): 654-657. July 1955. DLC (R11.C37, v. 33)

Continuous recordings were made of oxygen consumption and body temperature in 10 control and 10 restrained rats at room temperature (23° C.), and in 10 control and 10 restrained rats at 0° C. The restrained animals demonstrated a higher oxygen consumption at room temperature. In the cold, however, the oxygen consumption of the restrained animals as well as their body temperature fell below that of the control animals. From the data it was not possible to state which was the cause and which the effect. It is suggested that the decrease in oxygen consumption and body temperature may be the effect of another cause, emotionality or emotional stress.

3789
Baschieri, L.,
G. F. Mazzuoli, and P. L. Rinaldi
[EFFECTS OF O_2 INHALATION ON RESPIRATORY EXCHANGE IN BASAL CONDITIONS AND IN FATIGUE] Effetti della inalazione di O_2 sul ricambio respiratoria in condizioni basali e dopo affaticamento. — Rassegna di fisiopatologia clinica e terapeutica (Roma), 27 (12): 1025-1038. Dec. 1955. In Italian, with English summary (p. 1036). DNLM

Inhalation of a 50%-60% oxygen mixture for 30-60 minutes reduced the basal metabolic rate in subjects at rest, during muscular exercise, and at various stages of fatigue following exercise. The effect of oxygen on the metabolic response to fatigue may be interpreted by the changes in cellular metabolism induced by the increased oxygen content in the blood. (Authors' summary, modified)

3790
Basgal, W.
[PROFESSIONAL EFFICIENCY IN THE CAREER OF SPECIALIZED OFFICERS OF THE HEALTH SERVICE OF THE AIR FORCE] Eficiência profissional na carreira dos oficiais especialistas do Servico de Saúde da Fôrça Aérea. — Revista médica da aeronáutica (Rio de Janeiro), 7 (1-4): 12-25. Jan.-Dec. 1955. In Portuguese. DNLM

The steps prior to certification as aviation medicine specialist in the Brazilian Air Force include: (1) a basic course in aviation medicine (1 year); (2) a course in preventive medicine (1 year); (3) an advanced course in aviation medicine (1 year); (4) internship in aviation medicine (1 year); (5) practice of aviation medicine with proper supervision (2 years), and (6) examination for certification. Tabulation is made of the specialized health services of the air force such as dieticians, pharmacists, optometrists, aviation physiologists and psychologists, medical specialists, dental specialists, etc.

3791
Basowitz, H.,
H. Persky, S. J. Korchin, and R. R. Grinker
ANXIETY AND STRESS: AN INTERDISCIPLINARY STUDY OF A LIFE SITUATION. — xv+320 p. New York: McGraw-Hill Book Co., 1955. DLC (RC531.B3)

Observations were made of successful paratrooper trainees, trainee failures, and non-jumping paratroopers (control) immediately before, during, and after the three-week training period in order to determine the effect of stress on selected psychological and biochemical parameters indicative of anxiety. Anxiety (of harm and failure) as determined by self-rating and observation was found to increase moderately among trainees during the training period, in conformity with the degree of stress imposed (or felt), but was not correlated with eventual success or failure. Performance on the tachistoscopic closure, digit memory, and serial subtraction tests improved throughout the training period, but was generally lower than in the control group. Plasma amino acid, reduced glutathione, and eosinophil levels were decreased. Trainees with an initially higher hippuric acid level tended to be more vulnerable to apprehensiveness of injury or failure. Trainees who failed because of refusal to jump or inadequate performance showed an increased hippuric acid level and a slightly lower plasma glycine level. Statistical analyses were made of intra-individual variability, the relationship of data to adequacy in training, group personality differences, and intercorrelation of variables. Selected case histories are also presented. (139 references)

3792
Bass, D. E.,
C. R. Kleeman, M. Quinn, A. Henschel, and A. H. Hegnauer
MECHANISMS OF ACCLIMATIZATION TO HEAT IN MAN. — Medicine, 34 (3): 323-380. Sept. 1955. DLC (R11.M87, v. 34)

Five young men were acclimatized to heat by living and working for 14 consecutive days in a chamber maintained at 120° F. during the day, and at 100° F. during the night. The men performed a standard amount of work daily. The major physiological adaptations resulting in an improved ability to work during the early days of heat acclimatization appeared to be cardiovascular in nature. During adaptation the kidney tended to conserve sodium and chloride in excess of the amount required to compensate for sweat losses, with the result that plasma and interstitial fluid volumes were isotonically expanded. Increased activity of the pituitary-adrenal system was not a prepotent factor in the adaptation. (Authors' summary and conclusions, modified)

3793
Bassham, J. A.
EFFECT OF ENVIRONMENTAL CONDITION ON PHOTOSYNTHESIS IN MARINE ALGAE. — Univ. of California, Berkeley (Contract Nonr-222(19)). Final Progress Report, Jan 28, 1955. 8 p. AD 71 978 UNCLASSIFIED

Studies were conducted on several species of algae to select a species and set of growth conditions in which a high rate of photosynthesis could be maintained in sea water with a minimum of enrichment. No marine organism having as high a rate of growth as the fresh-water algae Chlorella and Scenedesmus was found. The marine Chlorella was found to grow half as fast as the fresh-water Chlorella, at a rate consistent with its relative chlorophyll content. Larger species of algae which would make separation from spent nutrient relatively easy were found to grow more slowly than small unicellular algae. Separation studies on several species of marine algae with photoelectric ability, which was found not to decrease photosynthetic rate, were unsuccessful for various physiological reasons. A continuous culture apparatus was developed in which the addition of new medium to standardize the density of the algal suspension is controlled automatically through a light beam and photoelectric cell. A closed gas circulating system was developed which continuously measures and records O_2 and CO_2 changes in the system. The efficiency of energy conversion during photosynthesis was found by this method to be about 40%. A technique for observing the absorption spectra of living cells was also developed.

3794
Bassi, M.,
and A. Bernelli-Zazzera
PRELIMINARY STUDIES ON THE METABOLISM OF VACUOLATED CELLS FOLLOWING HYPOXIA. — Experientia (Basel), 11 (3): 105-106. 1955. In English. DLC (Q1.A1E9, v. 11)

Vacuolated liver cells were produced in adult albino rats by exposing the animals to an atmosphere of 97% nitrogen and 3% oxygen for 2 hours. Analysis of liver slices indicated that the respiratory quotient, labile phosphorus, and total high energy phosphate bonds were decreased in vacuolated (hypoxic) tissues. Water content, oxygen uptake, and octanoic-oxidase and succinic-oxydase activities remained unchanged.

3795
Battig, W. F.,
J. F. Voss, and W. J. Brogden
EFFECT OF FREQUENCY OF TARGET INTERMITTANCE UPON TRACKING. — Jour. Exper. Psychol., 49 (4): 244-248. April 1955. DLC (BF1.J6, v. 49)

Measures of proficiency of tracking on the Pedastal Sight Manipulation Test were obtained at frequencies of intermittent target presentation of 2, 4, 6, 8, 10, 12, and 14 c.p.s. and a steady state condition above fusion (16 c.p.s.). The brightness of the target was held constant. The light-dark ratio for each frequency was 50/50. Two experiments varying practice conditions were performed. Only the tracking proficiency data for azimuth and elevation (AE), and azimuth, elevation and range (AER) were analyzed completely. Frequency of intermittent presentation of target has a significant effect on tracking proficiency. The relationship is linear. Least-square regression equations fitted separately to the AE and AER data for the two experiments reveal essentially the same slope, with the y intercept differing as a function of tracking measure and of amount of practice. (From the authors' summary)

3796
Battig, W. F.,
E. H. Nagel, and W. J. Brogden
THE EFFECTS OF ERROR-MAGNIFICATION AND MARKER-SIZE ON BIDIMENSIONAL COMPENSATORY TRACKING. — Amer. Jour. Psychol., 68 (4): 585-594. Dec. 1955. DLC (BF1.A5, v. 68)

The effects of six values of error-magnification and five values of movable marker-diameter on bidimensional compensatory tracking were studied. The four subjects in each cell of this 6 x 5 factorial design were given 15 two-minute tracking trials. Analysis of variance shows no effect of movable marker-diameter upon magnitude of tracking error. Error-magnification and practice are significant sources of variation and there is a significant interaction of these two variables, the effect of practice being to reduce tracking-error for each condition of error-magnification. The amount of learning, however, varies as a function of error-magnification. In all cases the effect of practice is completed by the tenth trial. The results are discussed in terms of a general hypothesis concerning a parabolic relation between tracking-error and the variables of control-display sensitivity, target-amplitude, and error magnification. (From the authors' summary)

3797
Bauer, M. H.
EFFECT OF LOWERED BODY TEMPERATURE ON HEMOLYSIN PRODUCTION AND MAINTENANCE. — Ann Arbor: Univ. Microfilms, 1955. Publication no. 10,840. iv+68 p. 43 ref. DLC

Daily reductions of 7-9° C. in the body temperature of rabbits by immersion for 8 hours had no effect on the amount of hemolysin produced after antigen injection during 3 days of exposure. Variable responses were observed to single 8-hour cold shocks at the peak of hemolysin production; no variation from controls was seen when cold shocks were continued for 3 days. It is concluded that the type of cooling studied is associated with no definite effect on the formation of circulating hemolysin.

3798
Baugé, M.
[DREPANOCYTOSIS COMPLICATED BY ACUTE SPLENOMEGALY DURING A FLIGHT AT HIGH ALTITUDE] Drépanocytose compliquée de splénomégalie brutale au cours d' un vol en haute altitude. — Sang (Paris), 2[illegible] (6): 620-621. 1955. In French. DLC (QP91.S24, v. 26)

A brief review is presented of recent articles describing the occurrence of acute splenomegaly associated with drepanocytosis during high altitude flight.

3799
Baxter, C.
SHOULD WE BUY ONE OF THESE? THE "AB INITIO": SOLUTION TO STUDENT JET FRIGHT. — Canadian Aviation (Toronto), 28 (4): 39. April 1955. DLC (TL501.C33, v. 28)

The introduction of a simple, inexpensive jet plane as the basic flying trainer for pilots is suggested to eliminate the problems of restraining and pilot fright which occur with conversion from piston-engine craft to jet fighters.

3800
Beaujón, O. 1954
[PROTECTIVE EYEGLASSES IN AVIATION] Anteojos protectores en aeronáutica. — Ciencia aeronáutica (Caracas), 1 (2): 30. Oct.-Nov. 1954. In Spanish. DLC

Protective eyeglasses for pilots are required which can filter and neutralize a percentage of visible spectral rays and a great proportion of the ultraviolet and infrared rays existing at altitude. Consideration is given to glass of the SECURIT type, unbreakable or TRIPLEX type, and to inflammable, shape-retaining PLEXIGLASS. It is recommended that pilots use dark red lenses which allow only 15% of the visible spectral rays to filter through, and absorb ultraviolet and infrared rays. These lenses can also be worn by deuteranopic persons. Green lenses are approved for persons with normal color vision, but cause ocular changes in protanopic persons.

3801
Beck, J.,
and J. J. Gibson
THE RELATION OF APPARENT SHAPE TO APPARENT SLANT IN THE PERCEPTION OF OBJECTS. — Jour. Exper. Psychol., 50 (2): 125-133. Aug. 1955. DLC (BF1.J6, v. 50)

Three experiments were conducted to investigate the relation between apparent shape and apparent slant in regard to the perception of the shape of an object in space under experimental conditions of reduced stimulation. The results suggest some doubt in the distinction between apparent form as sensation and apparent slant as a perception. Otherwise, the results were inconclusive for a theory of constancy.

3802
Beck, L. V.,
W. H. Linkenheimer, and A. Marracini
THE BIOCHEMISTRY OF TISSUE TRAUMA. IX. EFFECTS OF TUMBLING TRAUMA, SCALDING, AND HEMORRHAGE ON RAT TISSUE NONPROTEIN SULFHYDRYL. — Pittsburgh Univ. School of Medicine, Pa., ; issued by School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-1601-0017, Report no. 9), Jan. 1955. 8 p. AD 67 020 UNCLASSIFIED

Same as item no. 2456, vol. III.

3803
Becker, E. L.,
R. G. Cooper, and G. D. Hataway
CAPILLARY VASCULARIZATION IN PUPPIES BORN AT A SIMULATED ALTITUDE OF 20,000 FEET. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-53, June 1955. AD 78 159 UNCLASSIFIED

Seven puppies born at an altitude of 20,000 feet were studied histologically for changes in capillary area. Significant increases in the ratio of capillary area to tissue area were found in the brain, heart, and gastronemius. Other organs were examined, but were so engorged with blood that normal architecture and quantitative data were unobtainable. The possible significance of this increased ratio as an important step in acclimatization is discussed. (Authors' summary)

3804
Becker, E. L.
MYOCARDIUM IN PUPPIES BORN AT A SIMULATED ALTITUDE OF 20,000 FEET. — Amer. Jour. Physiol., 183 (2): 203-205. Nov. 1955. DLC (QP1.A5, v. 183)

Histological studies were made of the hearts of puppies born at a simulated altitude of 20,000 ft. to a female dog who had been living at this altitude for approximately 2 years. Hematoxylin and eosin stains of the myocardium revealed an increase in the number of nuclei and fibers per unit of tissue, and an increase in the length and diameter of nuclei. The data strongly suggest the occurrence of hyperplasia of the heart muscle. (Author's summary, modified)

3805
Becker-Freyseng, H.,
and M. Stammberg
[ON NON-HYPOXIC CHANGES OF THE ELECTROCARDIOGRAM AT HIGH ALTITUDE] Über nichtsauerstoffmangelbedingte Veränderungen des Hoen-Elektrokardiograms. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 184-187. 1955. In German, with English summary (p. 187).
DLC (TL503.W5563, v. 1954)

Electrocardiograms of 30 healthy men were recorded at sea level and while breathing O_2 at 11,500 m. altitude. The changes occurring at altitude are described and interpreted. There is evidence of changes in the position of the heart which, however, do not cause functional disturbances. Conclusions are drawn from these experiments with reference to aviation, particularly in regard to the use of thoracic and abdominal corsettage for the prevention of injuries due to explosive decompression and the gastrocardiac symptom complex.

3806
Beckh, H. J. A. von 1954
[STUDIES ON WEIGHTLESSNESS WITH HUMAN AND ANIMAL SUBJECTS DURING THE VERTICAL DIVE] Untersuchungen über Schwerelosigkeit an Versuchspersonen und Tieren während des lotrechten Sturzfluges. — In: Space-flight problems [International Astronautical Congress, 4th (Zurich, 1953), Proceedings], p. 196-202. Biel, 1954. In German. DLC (TL787.I44, 4th, 1953)

Essentially the same as item no. 2460, vol. III.

3807
Beckh, H. J. A. von
[PHYSIOLOGY OF FLIGHT] Fisiología del vuelo. 147 p. Buenos Aires: Editorial ALFA, 1955. In Spanish.
Abstract published in: Revista nacional de aeronáutica (Buenos Aires), 15 (162): 58-61. In Spanish. DLC (TL504.R547, v. 15)

A general treatise is presented on the physiology of flight which is directed not only to investigators in the field of aviation medicine but also to military and civilian pilots and parachutists. The first three parts deal with accelerations: their biological effects, the means of protection against them, and their role in the cause of aircraft accidents. Accelerations are classified according to origin (lineal, rectilineal), direction (radial), and direction affecting man (longitudinal, transverse). Included are sections dealing with kinetosis, zero gravity, the physiological aspects of space flight (spaceship environment, protection from radiations), and future trends in flight. (178 references)

3808
Beckman, E. L.,
O. L. Slaughter, and E. H. Wood
MEASUREMENTS TO EVALUATE THE EFFECTIVENESS OF THE FULL PRESSURE HALF SUIT IN APPLYING EXTERNAL PRESSURE TO THE BODY. — Mayo Clinic, Rochester, Minnesota; and Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5502, March 21, 1955. viii+32 p. (Project no. NM 001 060). AD 62 492 UNCLASSIFIED

A series of experiments was performed on 5 human subjects in order to evaluate the effects of applying, by means of an anti-blackout suit, known increments of external pressure to the body below the xiphisternum. In each subject, during a short inflation period at 1 g, the pressure measured within the g-suits was compared to (1) the pressure measured between the suit and the body surface, (2) the intrarectal pressure and, (3) the intraesophageal pressure. It was found that the pressure increment at the body surface was approximately 90 per cent of the suit pressure increment; the pressure increase within the rectum was 40-65 per cent of the suit pressure increase; and the rise in intraesophageal pressure was approximately 3 per cent of the rise in suit pressure. These pressure changes within the body are interpreted as aiding the venous return to the heart. (Authors' summary)

3809
Beckman, E. L.,
and H. L. Ratcliffe
A POST-MORTEM STUDY OF RHESUS MONKEYS (MACACA MULATTA) AT INTERVALS AFTER SINGLE OR REPEATED EXPOSURE TO NEGATIVE ACCELERATION. — Univ. of Pennsylvania School of Medicine, Philadelphia; and Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5504, May 26, 1955. vii+24 p. (Project no. NM 001 060.11.01, Phase I). AD 67 387 UNCLASSIFIED

Twenty-two monkeys, with appropriate controls, were subjected to one or more exposures of negative acceleration (12, 32, or 40 g) and killed 15 minutes to 90 days later. The results of these experiments suggest that current histological techniques offer little promise of explaining the effects of negative acceleration upon the functions of the brain. Scattered capillary hemorrhages and, occasionally, edema were the only lesions that might be related to acceleration. Thrombus formation, especially in the vessels of the lungs, commonly followed negative acceleration, and can account for the development of edema and hemorrhage in these organs 2 to 4 days after exposure. Animals subjected repeatedly to negative acceleration developed increased tolerance, and in them the adrenal cortex was hypertrophied. (Authors' abstract)

3810
Behnke, A. R.
DECOMPRESSION SICKNESS. — Military Med., 117 (3): 257-271. Sept. 1955. DLC (RD1.A7, v. 117)

Decompression sickness arises from the presence of nascent gas bubbles following too rapid decompression from ground level to high altitudes. The bubbles, chiefly intravascular, act as diffuse massive emboli to obstruct circulation and produce remarkably protean manifestations. Promi-

nent are pains (bends), respiratory distress progressing to asphyxia (chocks), circulatory obstruction giving rise to central and peripheral circulatory failure (shock), and spastic paralysis referable to spinal cord injury and chronic bone lesions. The mechanism of recompression is noted and case histories are reported illustrating the recurrent clinical error of inadequate recompression in terms of duration and degree of pressure required. In addition, a comparison is given of altitude and diving decompression sickness. (Author's summary, modified)

3811
Behr, K.,
L. Preber, and B. P. Silfverskiöld
RECORDING OF THE SKIN RESISTANCE IN THERMAL AND ROTATORY STIMULATION OF THE LABYRINTH. — Acta psychiatrica et neurologica scandinavica (København), 30 (5): 741-748. 1955. DNLM

The skin resistance was measured in fifty subjects during rotatory stimulation and/or thermal stimulation of the labyrinth (irrigation of the ear for 40 sec. with 100 cc. water at temperatures of 30° and 44° C.). The vertigo induced by cupulometric stimulation was accompanied sometimes by a fall in skin resistance difficult to distinguish from nonspecific falls due to emotional factors. Thermal stimulation often produced after a latent period of 2 to 3 min. a fall in skin resistance coincident with nausea. The fall in skin resistance occurred at times without any evidence of sweat or other signs of nausea. Different causes are discussed briefly. The method employed here provides simple means of recording vegetative vestibular reactions.

3812
Beischer, D. E.
CHOLESTEROL AND SERUM LIPOPROTEIN CHANGES DURING ACUTE STARVATION IN MAN. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 22, 1955. ii+13. (Research Report no. NM 001 107 102.05). AD 73 947 UNCLASSIFIED

The report demonstrates significant increases of free cholesterol and the fraction S_f 12-20 of the low density serum lipoproteins in 10 volunteers starving during a period of 4 days. Speculations in comparative physiology of starvation show that the survival chance of man may be improved by a knowledge of the pathways of fat metabolism in carnivorous animals. (Author's abstract)

3813
Beischer, D. E.
THE EFFECT OF SIMULATED FLIGHT-STRESSES ON THE CONCENTRATION OF SERUM CHOLESTEROL, PHOSPHOLIPID, AND LIPOPROTEIN. — Naval School of Aviation Medicine, Pensacola, Fla. Oct. 1, 1955. ii+10 p. (Research Project no. NM 001 107 102, Report no. 6). AD 89 998 UNCLASSIFIED

Slight increases of cholesterol were caused by muscular exercise (a step-test and a treadmill run) and low temperature (-10° C. for ten minutes). The stresses of low pressure (exposure of subjects in a low pressure chamber to simulated altitudes of 15,000 ft. for 20-min. and 18,000 ft. for 10-min. in another series of experiments), and mental stress (simulated breakdown of the vacuum regulator), g-forces (4-g for ten sec. in human centrifuge), and hyperventilation had no influence on the serum cholesterol concentration. These slight and transient elevations of serum cholesterol have no pathological significance. (Author's abstract, modified)

3814
Békésy, G. von
VIBRATION PATTERNS SIMILAR TO THOSE OBSERVED IN THE BASILAR MEMBRANE. — In: Office of Naval Research, Symposium on physiological psychology, p. 191-201. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100 UNCLASSIFIED

Certain phenomena observed in the vibration patterns of the basilar membrane in response to sound of varying frequency are explained using mechanical and electrical analogue models.

3815
Belding, H. S.,
and J. E. Wiebers
TYPES OF HAND BLOOD FLOW RESPONSE DURING SUCCESSIVE BODILY EXPOSURES TO COLD AND HEAT [Abstract]. — Federation Proceedings, 14 (1, part 1): 11-12. March 1955. DLC (QH301.F37, v. 14)

Of 32 lightly clad men exposed to rapid successive temperature changes of 80° F., 69° F. (cold), 80° F., 17 exhibited a fall in hand blood flow at a cold temperature and a rise at warm temperatures. Since conflicting results were obtained from the remainder of the men, and since the type of flow response was not correlated with grade of temperature or of sensation, the reliability of changes in hand blood flow as qualitative measures of vasomotor adjustments is questioned.

3816
Bell, A. L. L.,
and T. W. Howell
SCREENING TESTS FOR PULMONARY INSUFFICIENCY, THE TIMED AND TOTAL VITAL CAPACITY ANALYSIS COMPARED WITH THE MAXIMUM BREATHING CAPACITY TEST. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-7, March 1955. AD 68 776 UNCLASSIFIED

The need for a simple physiologic test for pulmonary insufficiency in flying personnel is discussed. The total vital capacity, the predicted vital capacity, the 2- and 3-second vital capacity, and the maximum breathing capacity were determined on 100 normal young males and male patients with ventilatory insufficiency. Normal values for the timed and total vital capacity tests in normal young males are established. Utilizing these simple tests a schema is presented which is superior to the maximum breathing capacity test to correctly discriminate patients with pulmonary insufficiency from normal young males. By virtue of its simplicity, reliability, and sensitivity the timed and total vital capacity analysis should prove of genuine usefulness to the Air Force as a screening test for flying personnel. (Authors' summary and conclusions)

3817
Bellecci, P.
[OPPORTUNITY TO STANDARDIZE THE METHODS OF EXAMINING COLOR AND LIGHT PERCEPTION] Opportunità di uniformare i metodi di esame del senso cromatico e luminoso. — Annali di medicina navale e tropicale (Roma), 60 (1): 75-82. Jan.-Feb. 1955. In Italian, with English summary (p. 82). DNLM

A brief review is presented of the methods (including Ishihara's test with Martin's lantern) used in France, England, and Italy for testing color and light perception in military personnel. Some suggestions are made for the improvement of these tests and a proposal presented that in one of the next international congresses of military medicine the opportunity of standardizing the tests be discussed.

3818
Benchimol, R.
[STATISTICAL ANALYSIS OF HETEROPHORIAS AND OF THE DIVERGENCE CAPACITY IN FLIGHT PERSONNEL] Análise estatística das heteroforias e da capacidade de divergência nos aeronavegantes. — Revista médica da aeronáutica (Rio de Janeiro), 7 (1-4): 41-50. Jan.-Dec. 1955. In Portuguese. DNLM

An examination of 226 civilian and military flight personnel between 14 and 47 years of age showed: (1) vertical heterophorias to be constant, with measurements of zero or very close to that (0.5 to 1.0 prism diopter); (2) horizontal heterophorias to be more variable demonstrating a constant need to adjust to the surroundings, and (3) the divergence capacity to be well limited between 4-5 prism diopters. Standardization is recommended of the number of prism diopters for use in the rapid and efficient examination of heterophorias and divergence capacity among flight personnel.

3819
Benford, R. J.
DOCTORS IN THE SKY. — xv+326 p. illus. Springfield, Ill.: Charles C. Thomas, 1955. DLC (RC1050.A33)

A narrative history of the founding, organizational progress, and contributions to the advancement of aviation medicine of the Aero Medical Association is presented. The annual meetings of the Association are described, and brief biographies of all past presidents are given. The founding of the School of Aviation Medicine (at Mitchel Field), the Journal of Aviation Medicine, the Air Service Medical Association, and the Airline Medical Examiners Association, and the passage of the Air Commerce Act and the Civil Aeronautics Act are related to the work of the Association or its members. The progress of the Associaton in the establishment of physical standards for pilots and in the standardization of procedures for the selection of flight surgeons is described.

3820
Benford, R. J.
[ORIGIN AND DEVELOPMENT OF THE LITERATURE OF AVIATION MEDICINE] Origine et développement de la littérature médico-aéronautique. — Médecine aéronautique (Paris), 10 (1): 25-30. 1955. In French. DLC (TL555.M394, v. 10)

The history of the literature of aviation medicine is briefly traced, from the publication in Paris in 1807 of a pamphlet concerning the physiological aspects of aviation to the appearance of the many aviation journals now in existence.

3821
Benjamin, F. B.
EFFECT OF PAIN ON SIMULTANEOUS PERCEPTION OF NON-PAINFUL SENSORY STIMULATION. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5506, July 12, 1955. iv+17 p. (Project NM 001 103 301, Report no. 5). AD 69 248 UNCLASSIFIED

An increase was observed in the threshold of hearing, vision, vibration, and heat sensation in all types of pain (experimental and clinical). The mean threshold-raising effect is generally proportional to the intensity of pain. Pain intensity at the time of testing may be modified by the relative attention to the painful and the non-painful stimulation.

3822
Benjamin, F. B.,
and O. Bailey
THE EFFECT OF SWEATING AND CHANGES IN BLOOD FLOW ON THE HEATING OF THE HUMAN SKIN. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5510, Aug. 30, 1955. v+18 p. (Project NM 001 103 301, Report no. 6). AD 75 722 UNCLASSIFIED

Acetylcholine-induced sweating protected the human skin against thermal radiation by raising its $k\varrho c$ (thermal inertia, a function of conductivity, density, and specific heat) 82%, while atropine-induced inhibition of sweating increased the heating effect by reducing the $k\varrho c$ 14%. Blood content and blood flow raised the initial skin temperature and protected against radiation by increasing the $k\varrho c$ 10.4% and 22.1% respectively. (Authors' abstract, modified)

3823
Benton, A. L.,
and H. P. Bechtoldt
THE ENLISTED PERSONAL INVENTORY (PART I) AS A PREDICTOR OF PERSONAL ADJUSTMENT AFTER RECRUIT TRAINING. — State Univ. of Iowa, Iowa City (Contract Nonr 311(00)); issued by Bureau of Naval Personnel. Personnel Analysis Div., Washington, D. C. Technical Bulletin no. 55-6, June 1, 1955. iii+14 p. AD 67 514 UNCLASSIFIED

The medical service records of 724 men discharged after a maximum of 19 months of service were analyzed, and the findings compared with scores on the Enlisted Personal Inventory (Part I) obtained during the first week of recruit training. On the basis of their records the men were classed in the following categories: (1) normal termination of active duty, (2) discharged for personal unsuitability during recruit training (court-martial cases excluded), (3) discharged for unsuitability after completion of recruit training, (4) discharged

for somatic disability during recruit training, and (5) discharged for disability after recruit training. The mean Personal Inventory group scores were found to be lowest for groups (1) and (5), followed respectively by groups (3), (4), and (2). Analysis of the proportions of men in each group placing at or above each Inventory score indicated that discrimination was successful between the normal group and groups discharged during recruit training, but not between the normal group and groups discharged after recruit training. The inventory is therefore considered to be a fair predictor of present status but of little value as a prognostic instrument.

3824
Beranek, L. L.,
S. Labate, and U. Ingard
NOISE CONTROL FOR NACA SUPERSONIC WIND TUNNEL. — Jour. Acoust. Soc. Amer., 27 (1): 85-98. Jan. 1955. DLC (QC221.A4, v. 27)

A muffler with an open cross-sectional area of 600 square feet was constructed to reduce the intensity of a complex noise of 5-10,000 c.p.s. produced by the operation of a jet engine in a supersonic wind tunnel. Helmholtz type resonators were employed to reduce noise between 5 and 20 c.p.s., a tuned set of six Fiberglas-lined square ducts for noise between 20 and 800 c.p.s., and two lined bends for noise at higher frequencies. Performance data indicate that the muffler system is entirely successful in eliminating the noise previously emitted from the tunnel.

3825
Berbert, J. H.
VISUAL ACUITY AS A FUNCTION OF INTENSITY FOR DIFFERENT HUES [Abstract].— Amer. Psychologist, 10 (8): 444. Aug. 1955. DLC (BF1.A55, v. 10)

Three subjects with normal visual acuity and color vision fixated two points of light on a dark background, whereby each subject varied the separation until the dots appeared just touching. The dots at this point were actually physically separated by a measurable distance, which was converted at each setting to angular subtense at the subject's eyes (minimum separable angle, m.s.a.). For each dot color (white, and wavelengths near 450 mμ, 500 mμ, 550 mμ, 600 mμ, and 650 mμ) m.s.a. settings were made for a range of intensities including the minimum intensity. The curves of m.s.a. versus intensity have the same general shape for all colors used. M.s.a. is a minimum for a midrange of intensities, whereas for both low and high intensities m.s.a. is relatively large. The effect of hue on m.s.a. is different for the different subjects. It is concluded that there is an optimum range of intensities for the resolution of luminous detail on a dark background. Either too low an intensity or one that introduces glare impairs resolution. Further observations are necessary to determine the influence of hue.

3826
Bergeret, P.
[AEROMEDICAL RESEARCH AND AERONAUTICAL TECHNIQUE] La recherche aéromédicale et la technique aéronautique. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 1-4. London: Butterworths Scientific Publications, 1955. In French. DLC (TL500.N6, no. 6)

The necessity is emphasized for research on the physiopathological effects of acceleration, decompression, ejection, etc., in actual flight as well as in the simulated conditions of the laboratory. The rapidity of physiological changes and the malfunctioning of conventional instruments of research in violent stress situations have necessitated the development of continuous recording methods, chiefly electronic, which are effective under stress.

3827
Beritashvili, I. S.
[ROLE OF VESTIBULAR AND KINESTHETIC STIMULATION ON THE ORIENTATION OF ANIMALS IN THEIR SURROUNDINGS] O roli vestibuliarnykh i kinesteticheskikh razdrazhenii zhivotnogo v okruzhaiushcheĭ sred. — Akademiîa nauk gruzinskoĭ SSR, Trudy instituta fiziologii (Tbilisi), 9: 3-22. 1953. In Russian. DLC (QP1.A4, v. 9)

Normal cats and dogs were studied first with their eyes closed, after which their labyrinths were destroyed one at a time at intervals varying between two weeks and some months; simultaneously the organ of Corti was destroyed, thus depriving the animal of the sense of hearing. Preoperative and postoperative observations extended over some months. Disturbances of spatial orientation caused by labyrinth destruction and conditioned nutrition reflex response returned to normal to a greater or lesser degree within two weeks in animals with the eyes open; elimination of sight, by covering the head of the animal, caused the orientation steps to become uncertain, zigzaggy and jerky, and the conditioned nutrition response was almost completely inhibited. However, with the tactile and olfactory senses intact and with persistent intensive training, the conditioned nutrition reflex response was largely susceptible to reactivation. The same was true of the animals' return to their resting spots after the experimental feeding.

3828
Berkowitz, L.,
and W. Haythorn
THE RELATIONSHIP BETWEEN DOMINANCE TENDENCIES AND LEADERSHIP CHOICE [Abstract].— Amer. Psychologist, 10 (8): 343. Aug. 1955. DLC (BF1.A55, v. 10)

The subjects in this study, all attending Officer Candidate School, were divided into 19 groups of six men each and assigned the task of assembling a foot bridge out of precut lumber. At the completion of the task the subjects indicated the extent to which they wanted the others in their group for the position of leader. One week later the ascendance scale of the Guilford-Zimmerman Temperament Survey was administered. The original hypothesis that the ascendance scores of the subjects nominated for leadership by the highly ascendant raters would differ from the scores of the subjects nominated for leadership by the lesser ascendant raters was not supported by an analysis of variance, but partially supported by a chi-square test employing ranks. There was a significant tendency for the submissive raters to nominate highly ascendant subjects as leaders and to reject other relatively submissive subjects for this position.

3829
Berry, C. A.
INFLIGHT HOLDER FOR INTRAVENOUS FLUID CONTAINER. — Med. Technicians Bull., 6 (3): 135-137. May-June 1955. DLC (RC970.U72, v. 6)

An inflight holder for intravenous fluid container for use while flying rescue missions in SA-16 and H-19 type aircraft is described and illustrated. This holder has been used on many rescue missions and has proven its worth even in extremely rough air.

3830
Berry, L. J.
CITRIC AND LACTIC ACID CONTENT OF TISSUES AND SUSCEPTIBILITY TO INFECTION AS INFLUENCED BY ACCLIMATIZATION TO ALTITUDE. — Bryn Mawr Coll., Bryn Mawr, Pa.; issued by School of Aviation Medicine, Randolph Field, Tex. July 1955. 10 p. (Project no. 21-1401-0004, Report no. 5). AD 78 160 UNCLASSIFIED

During the acclimatization of mice to simulated altitude the citric acid concentration of several organs was significantly lowered. The lactic acid concentration was unaltered in the same tissues. The susceptibility of mice exposed to altitude for 3 weeks and then infected intraperitoneally with either Salmonella typhimurium or pneumococci was compared to the susceptibility of infected normal mice following injections of Krebs cycle inhibitors or intermediates. Altitude mice are more susceptible to salmonellosis than mice kept at ground level only in the presence of injections of oxaloacetate, of citrate, and of saline, the latter serving as controls for the other substances injected. Higher mortality to pneumococci occurred with malonate and saline in altitude mice as compared with normal mice. Uninfected altitude mice are more susceptible than normal mice to injections of arsenite and malonate. (Author's abstract)

3831
Berry, L. J.,
R. B. Mitchell, and D. Rubenstein
EFFECT OF ACCLIMATIZATION TO ALTITUDE ON SUSCEPTIBILITY OF MICE TO INFLUENZA A VIRUS INFECTION. — Proc. Soc. Exper. Biol. and Med., 88 (4): 543-548. April 1955. DLC (QP1.S8, v. 88)
Essentially the same as: Bryn Mawr Coll., Bryn Mawr, Pa.; and School of Aviation Medicine, Randolph Field, Tex. Report no. 55-55, July 1955. 7 p. AD 95 144 UNCLASSIFIED

Mice acclimatized to a simulated altitude of about 20,000 feet for 3 weeks are more resistant to infection with influenza A virus than (a) normal mice, (b) mice similarly acclimatized but given 3 weeks of recovery at normal pressures prior to infection, and (c) mice made anemic by blood loss, the latter three groups showing no significant differences in susceptibility. Acclimatized mice maintained at altitude for the postinfection period are more resistant than those maintained at atmospheric pressures. These results are attributed to a metabolic disturbance which accompanies acclimatization to altitude and reduces the animal's capacity for virus synthesis. (Authors' abstract)

3832
Bertoni, T.
[FLIGHT SIMULATORS: THE NEW LINK TRAINER C11B] Simulatori di volo: il nuovo Link trainer C11B. — Rivista aeronautica (Roma), 31 (5): 489-503. May 1955. In Italian. DLC (TL504.R54, v. 31)

A new Link trainer, the C11B, which simulates jet flight in general, and T33 flight in particular, is described. It is to be used primarily in saving personnel and flight equipment, in the orientation and training of older pilots, and in the pre-flight training of pilots. Equipment described and illustrated includes the zero-reader (consisting of gyrocompass, gyro-horizontal, course selector, and altitude control) and equipment used in radionavigation.

3833
Bhatia, B.
EFFECT OF TRAINING ON THE ABILITY TO RECOGNIZE OBJECTS MOVING AT HIGH SPEED. — Aero Med. Soc. Jour. (New Delhi), 2 (1): 1-7. April 1955. DNLM

The method of training a subject to see a moving object (black letter) at high speeds is described. A control subject, as well as a subject before training, was able to recognize the object as long as its angular velocity did not exceed 50 per second; between angular velocities of 85-90° per second, visibility of the object was reduced to a faint streak. Trained subjects were able to recognize an object moving at angular velocities between 80° and 150° per second. Clear vision is made possible by rapid oscillatory movement of the eye in the line of motion of the object. Training to see objects moving at high angular velocities may provide a partial solution to the problem of visibility during low flying.

3834
Bianca, W.
THE EFFECT OF REPEATED SHORT TERM EXPOSURES TO HIGH ENVIRONMENTAL TEMPERATURES ON THE VOLUME AND HYDRATION OF THE BLOOD OF THE CALF [Abstract]. — Jour. Physiol. (London), 130 (3): 17P. Dec. 29, 1955. DLC (QP1.J75, v. 130)

Three calves were exposed for up to 5 hours per day for 3 weeks to an atmosphere of 45° C. with an absolute humidity of 17 mg./l., permitting only evaporative cooling. Except for a transient increase in cell volume during the first exposure to heat stress, no significant change in blood, plasma, or cell volumes was observed.

3835
Biersdorf, W. R.
CRITICAL DURATION IN VISUAL BRIGHTNESS DISCRIMINATION FOR RETINAL AREAS OF VARIOUS SIZES. — Jour. Optical Soc. Amer., 45 (11): 920-925. Nov. 1955. DLC (QC350.Q6, v. 45)

Visual brightness discrimination was investigated for three centrally fixated incremental areas (1°20', 5°, and 19°) each superimposed upon a 26° surround. Surround luminances from log I=3.48 to log I=-3.02. (millilamberts) were used. The objectives of the experiment were to find: (a) the shape of the transi-

tion between the two theoretical conditions It= constant and I= constant as the duration of incremental exposure was increased, and (b) the magnitudes of the critical durations at which this transition occurred. The results indicated that the transition between conditions It= constant and I= constant for central fixation was relatively sharp, regardless of field size or luminance level. This was true for both differential and absolute threshold determinations. The critical durations, depending upon field size, ranged from 0.02-0.06 second at high luminances to as long as 0.20-0.35 second at low scotopic luminance levels. The curves relating critical duration to log luminance showed irregularities in the mesopic range for the two larger fields. These irregularities were interpreted as indicating a possible transition between rod and cone functioning in this luminance range. (Author's abstract)

3836
Bietti, G. B.,
and M. Scorsonelli
[EFFECT OF O_2 ON THE SUPRESSION PHENOMENA IN BINOCULAR VISION OF STRABISMIC SUBJECTS] Azione dell'O_2 sui fenomeni di soppressione in visione binoculare degli strabici. — Rivista di medicina aeronautica (Roma), 18 (1): 23-67. Jan.-March 1955. In Italian, with English Summary (p. 63-64). DLC (TL555.A1R5, v. 18)

Oxygen inhalation was found to reduce or eliminate the phenomena of visual suppression in the binocular vision of strabismic subjects. Its beneficial effect on the phenomenon of crossing was tabulated in the presence of either normal or anomalous correspondence. In one third of the subjects O_2 inhalation induced the passage from anomalous correspondence to normal; the effect persisted for weeks and months, particularly when the eyes were or had gone into normal correspondence. Research on the Bjerrum screen in binocular vision showed that both central and peripheral suppression scotomata were constricted by O_2, even if only temporarily, whereas anoxia or ocular compression enlarged them. An effect similar to that of O_2 was obtained by the administration of strychnine, benzedrine, and intermedin. This indicates that strabismic visual suppression phenomena have a retinal localization.

3837
Bigio, A.
AIRPLANE LIFESAVER DEVICE. — U. S. Patent 2,693,923. Nov. 9, 1954. 5 leaves. DP

An aircraft escape device is described and illustrated, requiring no action on the part of the crew for its operation. It consists of a plurality of boxes, with a confined parachute, attached to the side of the airplane fuselage. Each compartment is detachable from the plane and is provided with the necessities of life and sanitation. It may be stocked with provisions, clothing, emergency heaters, signal flares, water, etc. This device is thought to minimize fear in the minds of the passenger.

3838
Bilger, R. C.,
T. D. Hanley, and M. D. Steer
THE RELATIVE EFFICIENCY OF MONAURAL VERSUS BINAURAL LISTENING IN VARIOUS LEVELS OF NOISE. — Purdue Univ., Lafayette, Ind. (Contract N6ori-104); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 104-2-40, April 13, 1955. 11 p. (SPECDEVCEN Project 20-F-8). AD 109 246. UNCLASSIFIED

The relation was studied between monaural (one ear) and binaural (both ears) listening in various levels of ambient noise (55, 80, and 105 db.) resembling that of conventional aircraft. Thirteen normal hearing subjects listened to recordings of equal-stress two-syllable (spondee) words in each of 12 conditions (four listening conditions--binaural with 2 phones in phase; binaural with two phones out of phase; monaural with unused ear covered with a dead phone; and monaural with unused ear exposed to noise--in each of three levels of ambient noise) by reducing noise intensity levels of successive words by one-decibel steps until the listener failed to repeat a word correctly, then raising the level of each successive word until the listener was able to repeat it correctly. Binaural listening conditions were superior to the monaural listening conditions, and the differences among noise levels were consistently significant. At the highest noise level investigated (105 db.) the ear-exposed condition was most similar to both binaural conditions.

3839
Bilodeau, E. A.
VARIATIONS IN KNOWLEDGE OF COMPONENT PERFORMANCE AND ITS EFFECTS UPON PART-PART AND PART-WHOLE RELATIONS. — Jour. Exper. Psychol., 50 (3): 215-224. Sept. 1955. DLC (BF1.J6, v. 50)

This study was concerned with determining techniques for rearranging the rank orders and altering the magnitudes of part proficiencies within a four-part, compensatory-pursuit task. Two variables, instructions and knowledge of results, were used over a period of 24 days to alter subject's pattern of attending to the four aspects of the task. These variables resulted in redistributions of part proficiencies and had very predictable effects upon criterion scores. In the present data the improvement in one part was accompanied by a loss or losses in other parts such that proficiency at doing four parts simultaneously tended to fall slightly. (Author's summary, modified)

3840
Bilodeau, I. M.
SELF-PACED REST WITH VARIATION IN WORK LOADING AND DURATION OF PRACTICE. — Jour. Exper. Psychol., 50 (4): 245-248. Oct. 1955. DLC (BF1.B6, v. 50)

Basic trainee airmen were used to explore the effects of prerest work loading and duration of prerest work on the duration of self-paced rest. Self-paced rest showed some tendency to increase with prerest work, and at each value of prerest work, the heavier of two work loadings yielded the longer rest. (Author's summary)

3841
Binet, L.,
M. V. Strumza, and I. Wesley
[RECOVERY AFTER ANOXIC APNEA IN THE NORMAL DOG] Réveil après apnée anoxique chez le Chien normal. — Comptes rendus de l'Académie des sciences (Paris), 241 (17): 1100-1102. Oct. 24, 1955. In French. DLC (Q46.A14, v. 241)

Two unanesthetized dogs were exposed in a series of 32 experiments to atmospheres with oxygen partial pressures of from 17.8 to 30 mm. Hg, until respiratory arrest occurred. The animals were then restored to a normal atmosphere, and the time between the first (agonic) respiratory movement and recovery of consciousness was measured. The average recovery period was found to increase with a decrease in the oxygen level. It is suggested that recovery occurs only after the neutralization by oxygen of inhibitory substances accumulating during anoxia.

3842
Binet, L.,
M. V. Strumza, and I. Wesley
[VARIATIONS IN THE DURATION OF PRIMARY ANOXIC APNEA IN THE REVIVED ANIMAL] Variations de la durée de l'apnée primaire anoxique chez l'animal éveillé. — Comptes rendus de l'Académie des sciences (Paris), 240 (20): 1953-1955. May 16, 1955. In French.
DLC (Q46.A14, v. 240)

Two unanesthetized dogs, one calm and one habitually agitated, were exposed in a series of 32 experiments to atmospheres with a varying oxygen partial pressure of from 17.8 to 30 mm. Hg until respiratory arrest occurred. The animals were then restored to a normal atmosphere, and the time between the initiation of apnea and the first (agonic) respiratory movement was measured. In the case of the calm dog, the average apneic period was found to increase with decreases in the initial partial pressure of oxygen. The reverse phenomenon was noted in the agitated dog: decreases in the initial partial pressure of oxygen caused a decrease in the average apneic period. The contradictory results were accredited to the difference in temperament of the two dogs. The apneic period was increased in the calm dog by injection of morphine, and greatly decreased by sympathomimetic or parasympathicolytic stimulation. Such stimulation had no effect on the agitated dog, while the injection of morphine retarded slightly the period of apnea.

3843
Birmingham, H. P.,
F. V. Taylor, and C. K. Trueblood
A STUDY OF THE IMPORTANCE OF THE DISPLAY-CONTROL DIRECTION RELATIONSHIP IN QUICKENED AND UNQUICKENED SYSTEMS [Abstract]. — Amer. Psychologist, 10 (8): 484-485. Aug. 1955. DLC (BF1.A55, v. 10)

A study was run to evaluate the penalty incurred for failing to observe the population stereotype (a) where there are lags between control movement and display response, and (b) where the display is quickened. Six subjects performed a compensatory tracking task. There were two variables in the experiment: (1) presence or absence of quickening, and (2) display control-display direction relationship. Three conditions of direction relationship were used: (a) normal, (b) reversed, and (c) cycling. The degeneration in performance in the (b) and (c) conditions over the (a) condition was much greater without quickening than in the circumstances where quickening was provided. The following conclusions were reached: (1) In a "loose" display-control relation it is important to adhere to the population-stereotyped direction relation. (2) In a "tight" or quickened relation the population stereotype has a much smaller effect on performance. (3) Quickening is a much more effective factor in man-machine system performance than the population stereotype.

3844
Birren, J. E.,
and J. Botwinick
AGE DIFFERENCES IN FINGER, JAW, AND FOOT REACTION TIME TO AUDITORY STIMULI. — Jour. Gerontol., 10 (4): 429-432. Oct. 1955. DNLM

Simple auditory reaction time was measured for the finger, jaw, and foot in young (18-36 years of age) and elderly (61-91 years of age) subjects. A 1000-cycle tone presented with ear phones was used as the stimulus. The reaction time of the elderly subjects was found to be significantly slower than the young subjects but there was no relation to the length of the peripheral nerve path involved. Since age differences between the reaction time did not significantly increase for the foot as compared with the finger and jaw, it is concluded that the age change in reaction time is not a variable associated with the length of the peripheral path. It is suggested that age changes in response latency be regarded as a property of the central nervous system. (Authors' summary, modified)

3845
Bitterman, M. E.,
W. H. Holtzman, and J. R. Barry
PSYCHIATRIC SCREENING OF FLYING PERSONNEL: CONDITIONING AND EXTINCTION OF THE GALVANIC SKIN RESPONSE AS A FUNCTION OF ADJUSTMENT TO COMBAT CREW TRAINING. — Univ. of Texas, Austin; and School of Aviation Medicine, Randolph Field, Tex. Feb. 1955. 9 p. (Project no. 55-29). AD 74 495 PB 117622

A group of 208 pilots assigned to Combat Crew Training were tested in a situation involving conditioning of the galvanic skin response to a sound using electric shock as the unconditioned stimulus. Their subsequent adjustment to training was evaluated independently. Four conditioning variables were selected on the basis of factor analyses for correlation with the criterion evaluations of adjustment. No significant relation was found between the two sets of measures. (AD abstract, modified)

3846
Bjerner, B.,
Å. Holm, and Å. Swensson
DIURNAL VARIATION IN MENTAL PERFORMANCE: A STUDY OF THREE-SHIFT WORKERS. — Brit. Jour. Indus. Med. (London), 12 (2): 103-110. April 1955. DNLM

Diurnal variations in mental performance were noted in persons performing a specific task repeated every hour of the day and night for several years. The diurnal frequency of error fluctuated in a remarkably regular manner, and was possibly due either to changes in the kind of work or to cyclic changes in the environment (temperature or degree of illumination). Since no fluctuations in the environment were found, it was assumed that diurnal fluctuation of error was due to individual variation in the capacity for mental performance. The greatest increase in error was found to occur at night.

3847
Black, J. W.
ALTERNATIVE SPEAKER LISTS FOR MULTIPLE-CHOICE INTELLIGIBILITY TESTS. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 51, May 15, 1955. iv+15+[24] p. (Project no. NM 001 104 500.51). AD 68 735 PB 118498

Possible error responses on the answer forms of the multiple-choice intelligibility tests outnumber the correct responses three to one. Each of these error responses in the printed answer sheets of Forms A, B, C, and D was read by at least 10 speakers to determine the usefulness of the words as test items. The speakers also read the standard lists of the tests. From the subsequent item analysis 12 alternative speaker lists were constructed for each form of the test. Mean intelligibility values for the lists are included. These permit the researcher to select and combine lists from the original and alternative lists within predetermined criteria of equality. (Author's abstract)

3848
Black, J. W.
CONTROL OF THE SOUND PRESSURE LEVEL OF VOICE. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 42, Feb. 15, 1955. iii+12 (Project no. NM 001 104 500.42). AD 62 338 PB 117653

Experimental subjects attempted to say a monosyllable with the same loudness that they heard repeated bursts of an external noise. The spoken syllables were of greater sound pressure level than the stimulus except when the stimulus exceeded an 80-db. level. The same subjects when dividing their total vocal dynamic range into four equal steps employed almost double the increment of sound pressure (db.) between the two softest levels that they employed between the successive pairs of louder levels. This "error" was in keeping with subjects' evaluations in bisecting the loudness range spanned by two levels of noise, also in setting a third level that extended an original loudness step upward by an equal amount. (Author's abstract)

3849
Black, J. W.,
and J. J. Dreher
NONVERBAL MESSAGES IN VOICE COMMUNICATION. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 45, March 15, 1955. iii+ 14 p. (Project no. NM 001 104 500). AD 62 421 UNCLASSIFIED

Five separate studies were made to determine how certain nonverbal factors in voice communications would be reflected in listener judgments concerning them. The results of each series of judgments are: (a) Groups of experimental subjects demonstrated the ability to restore recordings of unfamiliar voices to the original turn-table speed within a standard deviation of 1.4 r.p.m. (b) Phrases that were read before the readers' pupils were dilated were reliably differentiated from subsequent recordings made after a mydriatic had been administered but before the stage of serious reading impairment, with a criterion measure of judged certain vs. uncertain. (c) Phrases read to simulate certainty and uncertainty were reliably distinguished And (d) Phrases read as appropriate to three characterizations were reliably distinguished. (Authors' abstract)

3850
Black, J. W.
THE PERSISTENCE OF THE EFFECTS OF DELAYED SIDE-TONE. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project no. 39, Jan. 15, 1955. ii+ 6 p. (Project no. NM 001 104 500. 39). AD 62 324 PB 117621

Twenty-eight male experimental subjects read 10 lists of five 5-syllable phrases, including one practice list. Lists 3 and 4 were read in the presence of 0.30-second delayed side-tone. A similar control group read with no delayed side-tone. Measurements were secured of reading rate and sound pressure level. The incremental effects of delayed side-tone upon sound pressure level were transitory; the retarding effects upon rate or reading persisted throughout the remaining reading time, 150 seconds. (Author's abstract)

3851
Black, J. W.
THE PREDICTION OF THE WORDS OF VARIED MATERIALS. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 57, July 15, 1955. ii+12+ [31] p. (Project no. NM 001 104 500). AD 91 381 PB 122396

Samples of five-syllable phrases of similar length extracted from the language of flight instruction and newspapers were presented to experimental subjects who were asked to predict the successive letters and then progress to a succeeding letter with knowledge of the preceding ones. Phrases of flight instruction were more readily predicted than newspaper ones. Advantages also accompanied more words, more letters to judge, and longer words in the sample. Anomalous deviations present in judged samples and from other studies are noted. (Author's abstract)

3852
Black, J. W.,
and G. C. Tolhurst
THE RECEPTION OF REPEATED SPEECH SIGNALS. — Ohio State Univ. Research Foundation, Columbus (Contract N6onr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 48, April 15, 1955. ii+ 13 p. (Project no. NM 001 104 500). AD 68 732 PB 118445

Recorded monosyllables, comprised of consonant-vowel-consonant (CVC), in a variety of permutations, listened to simultaneously through a direct playback and a delay channel, were found to be successively relatively intelligible and unintelligible depending on different values of delay times.

Words, when delayed with a single 0.06-second delay time, were improved in intelligibility only when the direct and delayed channels fed, dichotically, the two ears separately. Words were more intelligible when repeated one by one than when the same words were repeated in groups of three simulating a connected phrase utterance. These word groups when repeated were more intelligible than single renditions of the separate words. (Authors' abstract)

3853
Black, J. W.
A RELATIONSHIP BETWEEN SPEAKING AND LISTENING. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Memorandum Report no. 54, June 15, 1955. ii+7 p. (Project no. NM 001 104 500).
AD 91 318 PB 122399

One hundred eighty panels of 12 members each responded to Forms C and D of the multiple-choice intelligibility tests in round-robin administrations. Rank order correlations between the listening and speaking scores of members of the 180 panels ranged from .02 to .87. The median value was .21. Low positive correlations of this magnitude are common in applications of these tests and suggest that intelligibility in speaking and listening are not independent skills. However, as more sources of stratification among scores are isolated the likelihood increases that these indications do not reflect a valid relationship. (Author's abstract)

3854
Blair, D.
FATAL PULMONARY EMBOLISM IN A PSYCHIATRIC PATIENT AFTER A JOURNEY BY AIR. — Brit. Med. Jour. (London), No. 4909:335. Feb. 5, 1955. DLC (R31.B93, No. 4909)

A case is reported of fatal pulmonary embolism occurring in a female psychiatric patient after an airplane journey. Included among the possible etiological factors are: (1) insufficient mobility due to bed treatment prior to embarkation, and on the plane for 18 hours; (2) sedation to control excitability, and (3) plane pressurization, which does not always supply exact ground atmospheric pressure of oxygen. In addition, measures are considered for the prevention of this complication.

3855
Blair, E.,
and J. B. Hickam
THE EFFECT OF CHANGE IN BODY POSITION ON LUNG VOLUME AND INTRAPULMONARY GAS MIXING IN NORMAL SUBJECTS. — Jour. Clinical Investigation, 34 (3):383-389. March 1955. DLC (R11.J67, v. 34)

The functional residual capacity (measured by the open-circuit helium method) became progressively smaller on passing from the standing to the seated position, from seated to recumbent, and from recumbent to Trendelenburg position. These changes depended primarily upon changes in expiratory reserve volume, since the residual capacity changed very little. Most of the subjects demonstrated in the standing and seated positions a slowly ventilated lung space, and on recumbency all but one demonstrated such a space. In general, the slow space became smaller and more slowly ventilated when the subjects lay down, and its ventilation rate was still further reduced in the Trendelenburg position. The volume of the slow space was approximately a fifth of the functional residual capacity in recumbent and head-down subjects. The minute turnover rate (ratio of ventilation to volume) of these slow spaces was, in general, less than 0.5. (Authors' summary, modified)

3856
Bligh, J.
A COMPARISON OF RECTAL, BICAROTID TRUNK AND PULMONARY ARTERY TEMPERATURES IN THE CALF UNDER HEAT STRESS [Abstract]. — Jour. Physiol. (London), 130 (3): 46P. Dec. 29, 1955. DLC (QP1.J75, v. 130)

No difference was observed between pulmonary artery and bicarotid trunk temperatures in calves exposed to environments of (1) 20°, 30°, or 40° C. at a low absolute humidity of 17 mg./l., (2) 40° C. at a high humidity of 34 mg./l., or (3) the latter environment with low humidity face mask permitting evaporation from the respiratory tract only. The temperatures in the first and third cases, but not in the second case, in which there was no heat loss, were 0.1-0.3° C. below rectal temperature. It is concluded that most evaporative cooling from the respiratory tract occurs in the respiratory passages rather than in the alveoli, and that the pulmonary artery temperature will always be lower than that of the rectum whenever there is heat loss.

3857
Block, J.,
and P. Petersen
SOME PERSONALITY CORRELATES OF CONFIDENCE, CAUTION, AND SPEED IN A DECISION SITUATION. — Jour. Abnormal and Social Psychol., 51 (1): 34-41. July 1955. DNLM
Reprint issued also as: Air Force Personnel and Training Research Center, Lackland Air Force Base, San Antonio, Tex. Research Report AFPTRC-TN-70, Dec. 1955. AD 108 578 UNCLASSIFIED

The present experiment investigated the general hypothesis that personality variables are relevant for an understanding of decision confidence and decision time. A number of personality correlates of decision in a psychophysical situation were found. Overly confident people tended to be rigid and dogmatic; overly cautious people tended toward introspection and self-abasement, and individuals with realistic confidence in their decisions appeared to be self-reliant and socially perceptive. Fast deciders (in this particular situation) were passive, suggestible, and conforming, while slow deciders were ascendant, self-assured and humorous. The results were discussed and related to some theoretical and methological issues. (Authors' summary)

3858
Bloom, A.
TRANSITION TO VARIABLE INTEGRATED AIRCRAFT OXYGEN SYSTEMS. — Jour. Aviation Med., 26 (5): 409-412. Oct. 1955. DLC (RC1050.A36, v. 26)

The author describes a miniaturized oxygen breathing regulator pressure reducer and automatic activator which helps to solve part of the problem of lack of cockpit space. It can be utilized with low pressure (70 p. s. i.) oxygen systems, high pressure (1800 p. s. i.) oxygen systems, and emergency oxygen supply systems. It can be integrated with any aircraft installation.

3859
Blount, R. H.
[DOWNWARD EJECTION DURING HIGH-SPEED FLIGHT] Ejection par en bas lors du vol à grande vitesse. — Médecine aéronautique (Paris), 10 (1): 51-52. 1955. In French.
DLC (TL555. M394, v. 10)

The first downward ejection from a fast-moving airplane (the B-47), performed experimentally by Col. Henderson of the U. S. A. F., is briefly described.

3860
Bolt Beranek and Newman, Inc.
FREE-FIELD NOISE MEASUREMENTS ON CARRIER-BASED JET AIRCRAFT NATC, PATUXENT RIVER, MARYLAND. —— Bolt Beranek and Newman, Inc. (Contract NObs 61592); issued by Bureau of Ships, Washington, D. C. Report no. 282, Feb. 4, 1955. 74 p. AD 78 060
UNCLASSIFIED

The results of an acoustical study to determine the characteristics of noise fields surrounding carrier-based jet aircraft are presented. Measurements were made on four different jet aircraft, an AJ-2, F2H-3, F9F-6, and an F7U-1, for several engine-operating conditions. The results of these measurements are presented in the form of directivity patterns, frequency spectra plots, and tabulated values of acoustic power. On the basis of this information a tentative design procedure has been developed for estimating the characteristics of the noise field around carrier-based jet aircraft knowing only the engine operating conditions. (Author's abstract)

3861
Bonnardel, R.
[STUDY OF AUDITORY THRESHOLDS IN AN INDUSTRIAL ENVIRONMENT AND OF THE NOISE DAMAGE OF A FOUNDRY AND A FORGE] Étude sur les seuils d'audition en milieu industriel et sur la nuisance des bruits de fonderie et de forge. — Travail humain (Paris), 18 (3-4): 173-192. July-Dec. 1955. In French.
DLC (T58. A2T7, v. 18)

A comparative study was made of the auditory thresholds of industrial job applicants and of men accustomed to working in a noisy environment. A constant average threshold was observed in the control group of 14 30-year-old subjects. The threshold increased at a rate of 2 decibels per year from 30 to 45 years of age, and increased more rapidly thereafter. The average threshold and the proportion of men with significantly defective hearing was increased in the noise-exposed group. The degree of threshold increase was independent of age but was positively correlated with duration of exposure to noise and proximity to the noise source.

3862
Booker, W. M.,
F. M. DaCosta, J. R. Tureman, C. Froix, and W. Jones
THE RELATION OF ASCORBIC ACID TO ADRENOCORTICAL FUNCTION DURING COLD STRESS. — Endocrinol., 56 (4): 413-419. April 1955. DLC (QP187. A25, v. 56)

The survival rates of intact and adrenalectomized mice during exposure to cold (42° F.) were studied. At six hours of exposure, 5% of the intact untreated animals survived; administration of ascorbic acid, cortisone, or combinations of the two increased the survival rate significantly. A peripheral relationship between adrenocortical hormones and ascorbic acid is suggested.

3863
Borgatta, E. F.,
and A. E. Eschenbach
FACTOR ANALYSIS OF RORSCHACH VARIABLES AND BEHAVIORAL OBSERVATION. — Psychol. Reports, 1 (3): 129-136. Sept. 1955.
DLC (BF21. P843, v. 1)

Basic data reported in item no. 4121 were utilized to explore further the relationships of Rorschach variables to behavioral variables. 15 Rorschach scores, scores for 11 basic categories from Interaction Process Analysis, 3 mental test scores, 7 ratings of aspects of personality and behavior, and 4 items of background information, were analyzed using Thurstone's complete centroid technique. Of the 8 factors extracted, 2 were defined in terms of Rorschach scores only (Rorschach productivity, formal properties of Rorschach), 2 in terms of both Rorschach and "external" variables (abstract intelligence, social intelligence) and 4 in terms of external variables only (emotional assertiveness, task leadership, social acceptability, maturity-adjustment). Since Rorschach scores had little or no common variation with a number of significant external variables, extreme caution should be exercised in using these scores in studies of personality and culture, and in the prediction of interaction behavior. (Authors' summary, modified)

3864
Bornschein, H.,
and F. Krejci
[ON A CLEARING EFFECT BY SUCCESSIVE APPLICATION OF VESTIBULAR AND OPTOKINETIC STIMULI] Über einen Bahnungseffekt bei sukzessiver Einwirkung von vestibulären und optokinetischen Reizen. — Experientia (Basel), 11 (5): 200-201. 1955. In German. DLC (Q1. A1E9, v. 11)

The nystagmus observed in rabbits during optokinetic stimulation produced by rotation of a patterned cylinder enclosing the field of vision was increased in amplitude and frequency by a preceding period of rotatory vestibular stimulation. The persistent clearing effect was independent of the direction of the optokinetic stimulus relative to the vestibular stimulus. It cannot therefore be attributed to the addition effect occurring in simultaneous stimulation, but rather implies a neuronal coupling of the vestibular and optical reaction systems.

3865
Bosee, R. A.,
and W. C. Buhler
ESCAPE FROM VERTICAL TAKE-OFF AIRCRAFT.

—— Jour. Aviation Med., 26 (4): 319-322. Aug. 1955. DLC (TL555.A1A4, v. 26)

This article describes the latest procedure which has been experimentally proven for escaping from vertical take-off aircraft. A completely automatic escape mechanism has been devised and tested; it is now in use in both the Lockheed XFV-1 and Convair XFY-1 aircraft. The escape mechanism operates as follows: the ejection seat is fired; a modified safety belt, which has a self-opening mechanical lap buckle, is released as the seat rises; two nylon cords attached to the rear corners of the seat snub it at a distance of 6 feet from the craft and the pilot is separated; a new-type faster opening parachute with "pocket bands" is released by a static line, and inflates. This new parachute will open even if there is forward motion of the plane (as in landing) at an altitude of 200 feet or more, and it will open with only 25 feet of altitude if the plane has a forward velocity of 200 knots. This escape system has been tested by means of 55 static firings from a ground launcher into an elevated net, by 3 in-flight ejections from a Douglas JD-1 aircraft at 150 knots, by ejection over a 260 foot cliff seven times carrying anthropomorphic dummies; and by 9 dummy ejections from a rocket sled at speeds from 200 to 400 knots. All tests were successful.

3866
Bostic, S. C.,
and H. J. Worsham
HEARING AND INDUSTRIAL NOISE. — U. S. Armed Forces Med. Jour., 6 (1): 75-80. Jan. 1955. DLC (RC970.U7, v. 6)

Employees at a naval air station exposed to dangerous noise intensities were evaluated for hearing level by means of pure-tone audiometry. Tests were performed in the dispensary within the industrial area (noise level of 55-65 decibles) and compared with those performed in a low-intensity chamber (noise level of 26-30 decibels). The environmental role in audiometry is noted. The number of persons suffering hearing loss at various frequencies was found to vary with their occupation and proximity to the sources of noise. Forty-one percent of a small group of sandblasters, for example, had a binaural loss of more than 10%.

3867
Bostroem, B.,
and W. Lochner
[ON THE OXYGEN CONSUMPTION OF THE LUNG]. Über den Sauerstoffverbrauch der Lunge. —— Pflügers Archiv für die gesamte Physiologie, 260 (6): 511-522. 1955. In German. DLC (QP1.A63, v. 260)

Measurements were made of oxygen consumption of the lung tissue of an isolated lobe of lung connected to the circulatory system of a donor dog. Under normal experimental conditions the O_2 used amounted to 0.071 $cm.^3$ O_2/min. times grams of tissue (dry weight). After hemorrhage there is a significant increase in the use of O_2 by the lung, exceeding the normal 6-7 times. Estimates indicate that 10-30% of the total O_2 metabolism takes place in the lungs. It is suggested that some intermediate metabolic products such as lactic acid are oxidized in the lung. Under certain circumstances an error may be made in measuring the cardiac output by Fick's method. (Authors' summary, modified)

3868
Bothwell, T. H.,
and B. Mallett
DIURNAL VARIATION IN THE TURNOVER OF IRON THROUGH THE PLASMA. — Clinical Sci. (London), 14 (2): 235-239. 1955. DNLM

The effect on plasma iron turnover of diurnal changes in plasma iron level was studied in 20 subjects by measurement of the rate of disappearance of injected radioactive iron from plasma during morning and evening. A negative correlation was observed between alterations in plasma iron level and the fraction of iron removed per hour. Since alterations in the latter parameter were less than changes in plasma iron concentration, a positive correlation was maintained between changes in iron concentration and turnover per hour. Considerable variation in individual results was noted.

3869
Botwinick, J.,
and J. E. Birren
AGE DIFFERENCES IN JAW, FINGER, AND FOOT REACTION TIME TO AUDITORY STIMULI [Abstract]. —— Amer. Psychologist, 10 (8): 334-335. Aug. 1955. DLC (BF1.A55, v. 10)

The auditory reaction time was measured for a group of men in the age range 19-36 years, and for a group of elderly men, age range 61-91 years. A visual ready signal preceded the auditory stimulus by 1 to 6 sec. at random. Median reaction times were computed for finger, foot, and jaw of each subject. The split-half reliability was respectively .92, .96, and .94. The reactions of the elderly subjects were not progressively slower as a function of the path length. The age difference between the reaction times of the jaw, finger, and foot was approximately a constant difference of .07 second. This and other evidence suggests that the slowing with age is a general factor underlying all reactions controlled by the central nervous system.

3870
Bouman, M. A.,
and P. L. Walraven
SOME PROBLEMS IN TESTING COLOUR VISION. —— In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 179-185. London: Butterworths Scientific Publications. 1955. DLC (TL500.N6, no. 6)

The lack of basic knowledge of the physiology of color discrimination has necessitated the use of color naming tests for the identification of normal and anomalous color vision. Since such tests are applicable only to the specific visual situation tested, tests should approximate the visual activity for which selection is required. The occurrence of consistent errors in the discrimination of signal lights in various test situations (even with normal color vision) suggests the necessity for the replacement of colored signal lights by a configurational signal system.

3871
Bourdy, C.
[ON THE INFLUENCE OF THE SIZE OF THE TEST OBJECT, ITS ECCENTRIC ANGLE, AND THE SPECTRAL COMPOSITION OF THE LIGHT USED ON NIGHT BINOCULAR CONVERGENCE] Au sujet de l'influence des dimensions du test, de son excentricité et de la composition spectrale de la lumière utilisée, sur la convergence binoculaire nocturne. — Comptes rendus de l'Académie des sciences (Paris), 240 (13): 1475-1476. March 28, 1955. In French. DLC (Q46.A14, v. 240)

The effect on binocular convergence of variations in the size, eccentric angle, and color of a test object placed 20 cm. from the eyes of two subjects and observed under illuminations of 1 to 10^{-6} c./m^2 was studied. It was found that an increase beyond a certain size had no effect on the decreasing course of binocular convergence under decreasing illumination. Increases in eccentric angle and the use of a red, but not a blue, filter decreased the binocular convergence.

3872
Bourne, G.
EFFECTS OF FLYING ON PATIENTS WITH CARDIOVASCULAR DISEASE. — Brit. Med. Jour. (London), No. 4909: 310-313. Feb. 5, 1955. DLC (R31.B93, no. 4909)

Thirty patients with organic cardiovascular diseases (hypertension, angina of effort, myocardial infarction, and other heart diseases) were able to undertake air travel successfully. In all cases the state of cardiac compensation was good at the time of flying, and in no patient did air travel deleteriously affect the heart or the hypertension, either at the time or subsequently. Adequate cabin pressurization was maintained at all times. The benefit of a short air journey is noted in comparison to a longer sea voyage in cases requiring close contact with specialized medical care as well as in persons traveling for personal reasons.

3873
Bowen, H. M.,
and M. M. Woodhead
ESTIMATION OF TRACK TARGETS AFTER PREVIEW. — Canad. Jour. Psychol., 9 (4): 239-246. Dec. 1955. DLC (BF1.C3, v. 9)

An experiment was conducted to explore differences between four types of navigational display for a track prediction task. Twelve subjects predicted from immediate experience the targets of initiated tracks on four grids: (1) exponential polar coordinate, (2) linear polar coordinate, (3) exponential cartesian coordinate, (4) linear cartesian coordinate. Two forms of error were distinguished. One form was associated with the distance to be predicted and was typically an error of underestimation. The other was associated with the type of display on which the prediction is made, and was greater with polar-type displays than with cartesian-type. Of the four displays used, the exponentially scaled polar coordinate yielded significantly worse performance than the other three. (Authors' summary)

3874
Bowles, J. W.,
and D. V. Torr
AN ATTITUDE SURVEY OF AFROTC CADETS. — Personnel Research Lab., Air Force Personnel and Training Research Center, Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-40, Nov. 1955. viii+45 p. (Project no. 7701, Task no. 77040). AD 94 662 UNCLASSIFIED

The Air Reserve Officer's Training Corps Survey CE 526 AX was administered in the spring of 1952 to 58 AFROTC units throughout the country, to provide Headquarters USAF with information concerning the attitude of cadets toward flight training, the AFROTC program, and AFROTC instructors. The following results were obtained: (1) Significant differences were observed among schools in the number of students intending to volunteer for flight training. (2) Civilian administration of the test was more efficient than administration by military instructors; the type of administration did not influence responses concerning flying intention, but did influence other attitude responses. (3) A significant decrease in potential flight volunteers was observed from the junior to senior years (4) The percentage of potential volunteers who thought they could pass the flight physical exam was greater than the percentage of nonvolunteers; a follow-up study indicated that the self evaluation of the students tended to be accurate (5) The potential volunteers more frequently planned a career in the Air Force and in general had a more favorable attitude towards the Air Force and the AFROTC program.

3875
Bowman, N. J.
CLEARING THE AIR. I. — Jour. Brit. Interplanetary Soc. (London), 14 (5): 291-293. Sept.-Oct. 1955. DLC (TL790.A1B7, v. 14)

The author discusses and rejects J. B. S. Haldane's value of 3% (see item no. 4296) as the maximum permissible concentration of CO_2 in space cabin atmosphere. In view of the incomplete knowledge of the processes of acclimatization to such concentrations of CO_2 there is a possibility of harmful consequences of changes in respiration, blood and kidney functions, and excretion in response to CO_2. The minimum sodium chloride requirement for the human organism is more flexible depending upon activity level, environmental conditions, and time period. Contradictory references are cited in respect to the use of lithium compounds for CO_2 absorption in the cabin atmosphere.

3876
Boynton, R. M.,
and W. R. Bush
LABORATORY STUDIES PERTAINING TO VISUAL AIR RECONNAISSANCE. — Univ. of Rochester, N. Y. (Contract AF 33(616)-2565); issued by Wright Air Development Center, Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-304, Part 1, Sept. 1955. v+41 p. AD 91 874 UNCLASSIFIED

An empirical investigation is reported of the recognizability of various-shaped figures as a function of brightness contrast and distance. An apparatus was used whereby three observers could view a complex array of forms (rectilinear and curvilinear) under varying conditions of distance, exposure time, number of forms, and brightness

contrast. Rectilinear figures, placed among an array of curvilinear figures, were presented to subjects and the per cent correct responses tabulated. The probability of correct response increased linearly with exposure time (up to approximately 12 seconds), decreased linearly with log number of curvilinear forms, and decreased linearly with subject-figure distance. The effects of figure-density, figure cluster, and learning were also evaluated. (Authors' abstract, modified)

3877
Boynton, R. M.
SENSITIVITY CHANGES DURING ADAPTATION TO ILLUMINATION. — In: Office of Naval Research, Symposium on physiological psychology, p. 58-69. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100 UNCLASSIFIED

A method for studying the onset of light adaptation in the visual system is described. Essentially it consists of measuring the transition between the absolute threshold and luminance discrimination threshold. The absolute threshold rises very fast, reaches a maximum 0.05 sec. after the onset of adapting stimulus and then declines to a steady-state value. The luminance discrimination threshold is very high 0.05 sec. after the beginning of the adapting stimulus. The application of this procedure to problems of color vision is discussed. The data are presented within an opponent-colors theoretical framework.

3878
Boysen, J. E.
AVIATION MEDICINE AT THE CROSSROADS. — Jour. Aviation Med., 26 (2): 124-129. April 1955. DLC (RC1050.A36, v. 26)

The aeronautical industry, composed of aircraft manufacturers, civilian airlines and military air services, requires a medical service guided and managed by qualified physicians. The postgraduate training of physicians must include the application of medical techniques designed to control the environmental stresses of aeronautics on the ground and in the air, and to cure and rehabilitate those employees adversely affected, ground crews and aircrews alike. The industry requires an effectively managed medical organization, adequately prepared, to cope with medico-legal and other administrative problems in a manner insuring credit to its parent organization. The basic criteria of such a curriculum are the basic medical sciences, preventative medicine, therapeutic medicine, and medical administration. (Author's summary, modified)

3879
Bradley, J. V.,
and N. E. Stump
MINIMUM ALLOWABLE DIMENSIONS FOR CONTROLS MOUNTED ON CONCENTRIC SHAFTS. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-355, Dec. 1955. vi+41 p. AD 93 135 UNCLASSIFIED

Experiments were performed to determine the minimum allowable dimensions of circular, non-detent knobs mounted upon concentric shafts. Measures were taken of reach time, turning time, and inadvertent touching of adjacent coaxial knobs. Manipulated variables were thickness, diameter, and difference in diameter between the operated knob and the adjacent knobs. If three knobs are to be concentrically ganged, and if the middle knob is about 2 in. in diameter (1) the diameter of the front knob should be at least 1 in. smaller, and that of the back knob 1 1/4 in. greater, than that of the middle knob, (2) the front and middle knobs should both be 3/4 in. thick but the back knob may be as thin as 1/4 in. These statements apply to both unshielded knobs and knobs shielded against inadvertent operation. Statistically significant decrements in performance were found when dimensions smaller than these were used. Panel space will seldom be saved by concentrically ganging knobs when the following conditions obtain: (1) the knobs can be operated by application of moderate torque, (2) the difference in diameter between concentrically mounted knobs is large enough to avoid frequent inadvertent operation, (3) small-diameter (1/2 in. to 1 in.) nonganged knobs are acceptable substitutes for the larger-diameter concentrically ganged knobs. (Authors' abstract, modified)

3880
Bradley, J. V.,
and N. E. Stump
MINIMUM ALLOWABLE KNOB CROWDING. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-455, Dec. 1955. v+21 p. (Project no. 7182-71514). AD 90 898 UNCLASSIFIED

Reach time, turning time and inadvertent touching of adjacent controls were measured while a standard setting was made with one of several closely spaced knobs. Variables manipulated were spacing between knobs, knob diameter and knob configuration. Performance improved rapidly with increasing distance between knob edges up to an interperipheral distance of 1 inch, after which it continued to improve but at a much slower rate. For equal amounts of panel space consumed by several closely crowded knobs, ½ inch diameter knobs were more nearly error free than were the larger diameter knobs tested. For equal distance between knob edges, however, performance improved with increasing knob diameter. These results apply only to knobs capable of being operated by moderate torque. Gloves apparently had little effect upon speed of knob operation. It was found that the frequency with which a crowding knob is inadvertently touched is strongly affected by the angular position which it occupies with respect to the operated knob but is practically independent of the presence of other crowding knobs at the same distance from the operated knob. (Authors' abstract)

3881
Bradley, W. A.
and R. F. Gray
METHOD AND MEANS FOR INCREASING AIRPLANE PILOT'S RESISTANCE TO ACCELERATION FORCES. — U. S. Patent 2,707,087. April 26, 1955. 4 leaves. DP

A system is proposed for increasing the resistance of airplane pilots to the adverse effects of high angular acceleration by an automatic or manual change in the pilot's position within the plane from the normal seated position to a raised and forward-tilted position.

3882
Brady, J. S.
THE HUMAN OPERATOR AS AN AIRCRAFT SYSTEMS COMPONENT. — Aeronaut. Engin. Rev., 14 (10): 86-90. Oct. 1955. DLC (TL501.A326, v. 14)

Pilot's performance in aircraft systems design is analyzed within the frame of reference of his intra- and/or suprasystem functions. The requirements of the operator for design of information displays are discussed in terms of end-point versus situational displays, control-display and performance-display relations, particularly the "unburdening" and "quickening" techniques, and the utilization of alternative sensory channels for information to avoid overloading the visual channel. The control-system design has to take into consideration both the intra- and supra-system functions of the operator and his characteristics as a decision generator and an information transducer. Practical limitations of system design for optimum operator utilization are enumerated.

3883
Brand, H.,
and P. J. Woods
THE ORGANIZATION OF THE RETENTION OF VERBAL MATERIAL. — Univ. of Connecticut, Storrs (Contract 631(00)); issued by Office of Naval Research. Technical Report no. 16, June 1955. 21 p. AD 75 481 UNCLASSIFIED

A study was conducted to compare the organization of the free recall of a scrambled list of 60 meaningful words at successive intervals immediately after brief presentation and one, two, and three weeks later (successive retention) or at one of these intervals only (separate retention). Subjects were instructed during 10 minute retention tests to write down words in the order in which they were recalled. Clustering, or the occurrence of sequences of words in the same category, was found to decrease significantly after one week in both groups. In the successive retention group clustering increased during the second week to the level obtained in immediate recall. The separate retention group showed a continued decline in clustering. Words recalled were in addition categorized as original words (L), related words (NL) and unrelated words (I). A decline in L words was noted in both groups, but was greater in the separate retention group. In the separate retention group, the number of I words increased rapidly to the level of L words, but decreased after the second week. The number of I words was not high in the successive retention group, and declined after the first week.

3884
Brandt, U.
[AVIATOR'S VERTIGO: A PSYCHOSOMATIC STUDY] Aviator's vertigo—Flygaryrsel; en psykosomatisk studie. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (2): 13-21. 1955. In Swedish. DNLM

The author discusses the functions of various equilibrium organs and their sensitivity to changes in body position. Different illusions experienced by pilots during instrument flight are described and illustrated, i. e. such occurring during linear and rotatory acceleration, changes of distances between aircraft in formation, and leveling-off maneuvers. The primary sensory effect is not the basic cause of vertigo; it is rather a psychological reaction which augmented by anxiety, hesitancy, and a feeling of helplessness, may trigger a panic reaction. Examples are cited.

3885
Brasil, H. V.
[ATTENTION] A attenção. — Revista médica da aeronáutica (Rio de Janeiro), 7 (1-4): 76-83. Jan.-Dec. 1955. In Portuguese, with English summary (p. 83). DNLM

The psychological processes of attention is defined as a unification of activity in one direction. Personal emotional habits or an insignificant and uncertain stimulus are unfavorable factors for proper attention. Favorable factors include a stimulus with good movement, quality, and repetition. Attention disorders discussed are: distraction, difficulties in concentration; reduced mental capacity for attention; and simultaneous attention to various impressions. The significance is noted of attention tests in the selection of flight personnel, as criteria for the grounding of pilots, and in the determination of flight fatigue. They are also useful during the design and evaluation of instrument panels.

3886
Braun, W. von
[SPACE FLIGHT--A TASK FOR INTERNATIONAL SCIENTIFIC COOPERATION] Weltraumfahrt--eine Aufgabe für die internationale wissenschafliche Zusammenarbeit. — In: Probleme aus der astronautischen Grundlagenforschung [International Astronautical Congress, 3rd (Stuttgart, 1952), Proceedings], p. 246-256. Stuttgart, 1952. In German, with English summary (p. 246-247). DLC (TL787.I44, 3rd, 1952)

Research opportunities in the field of space travel are enumerated. In the area of space medicine solutions are needed for detoxication of accumulating respiratory and other waste products and toxic vapors released by structural materials, lubricants, and metals. It may be necessary to supress bacterial and viral growth, add certain supplements, such as, salt, iodine, or dust, to the cabin air. The effects of continuous weightlessness on the human organism require investigation under laboratory conditions. Continuous weightlessness also poses problems in relation to performance of tasks. Subjects such as these may serve for doctor's or master's theses.

3887
Brendel, W.,
and H. L'Allemand
[THE EFFECT OF MEGAPHEN ON THE THERMOREGULATION] Der Einfluss von Megaphen auf die Wärmeregulation. — Naunyn-Schmiedebergs Archiv für experimentelle Pathologie und Pharmakologie (Berlin), 225 (112): 87-90. 1955. In German. DNLM

Experiments were conducted with dogs to determine (a) whether or not Megaphen [chlorpromazine] possesses a histoplegic effect in larger mammals, and (b) what the effects of Megaphen are on the thermoregulatory reactions against cold. Respiratory metabolism and rectal temperature were recorded in

5 dogs in a normothermic environment (23°-24° C.) and under cold stress (0° C.), while in an undrugged state, after Megaphen administration, after a lytic cocktail, and under Pernocton anesthesia. Megaphen affects thermoregulation in cold chiefly by its effects on respiration, i. e. by increasing the depth of respiration, and decreasing the respiratory rate without changing the respiratory volume. In small animals respiration is an important thermoregulatory mechanism, therefore Megaphen exerts a greater effect on thermoregulation in cold in these than in the larger mammals.

3888
Breuninger, H.,
and W. Schmid
[THE REACTION OF THE BLOOD PRESSURE TO ARTIFICIAL HYPO- AND HYPERTHERMIA AND ITS PHARMACOLOGICAL INHIBITION] Über Blutdruckreaktionen auf künstliche Hypo- und Hyperthermie und ihre pharmakologische Beeinflussbarkeit. —— Naunyn-Schmiedebergs Archiv für experimentelle Pathologie und Pharmakologie (Berlin), 225 (3): 251-259. 1955. In German. DNLM

The shifts of blood pressure upon rapid cooling and rewarming of the organism were studied in the rat, guinea pig, and the golden hamster. The rise of blood pressure during cooling and overheating is a centrally regulated emergency function. This response was inhibited through (a) a central block; completely by anesthetics, partially by antihistaminics; (b) a peripheral block, primarily by adrenolytics including megaphen and spartein; and (c) an adrenal medulla block by spartein. Morphine and parasympatholytics were without an effect. There was no definite relation between the inhibitory effects of these drugs and their analgesic or antipyretic value. The locus for inhibition of the emergency function varies for different drugs with a central action. (From the authors' summary)

3889
BRITISH JET TRAINER LAYOUT UNUSUAL. —— Amer. Aviation, 19 (15): 38-39. Dec. 19, 1955. DLC (TL501.A675, v. 19)

A jet trainer designed by F. G. Miles, Ltd., Shoreham, England, features side-by-side seating, a low-set cockpit, central keel for protection in belly landings, powerplants above and aft of the cabin, and fuel tanks in the wings for fire protection.

3890
Broadbent, D. E.
SUCCESSIVE RESPONSES TO SIMULTANEOUS STIMULI. ——Medical Research Council (Gt. Brit.). Applied Psychology Research Unit, Cambridge; issued by Flying Personnel Research Committee. Report no. 934, April 1955. 21+1 p. AD 73 514 UNCLASSIFIED

The behavior of the perceptual processes during simultaneous presentation of information to separate sensory channels was investigated. Subjects were presented with six digits (two per second) in successive pairs to the ears, eyes, or simultaneously to the ears and eyes. It was observed that subjects normally reproduced the three digits on one channel before those of another. The accuracy of recall under various conditions is analyzed. Conclusions drawn from the collected results of the experiments are that (1) two separable mechanisms are present in the listener, one a storage mechanism by which information is held simultaneously, and the other a perceptual mechanism, through which each collective item passes successively; (2) the first material to pass through the perceptual mechanism is more accurate; and (3) the perceptual mechanism produces greater accuracy when it deals with stimuli at the moment of arrival.

3891
Brody, S. I.
SOME AEROMEDICAL ASPECTS OF ALL-WEATHER FLIGHT. —— Jour. Aviation Med., 26 (1): 24-28. Feb. 1955 DLC (RC1050.A36, v. 26)

The author proposes a need for simplification of aircraft instruments required by the pilot in order to successfully navigate during poor weather conditions. He states that the present complex of dials, switches, and controls which must be operated and scanned by the aviator is too abstract for rapid understanding and reaction. The Office of Naval Research and the Bureau of Aeronautics are at present engaged in a project to integrate many of these controls. The ultimate goal is to produce a system of instruments which will present cues to the pilot that simulate visual contact with the ground. The author discusses the definite hazard of hypoxia under all flight conditions but especially so during instrument flight in modern jet planes. The danger from hypoxia lies in the visual disturbance and the distortion of judgment which results. High g forces must also be guarded against by adequate anti-blackout measures. Comprehensive instructions in emergency escape procedures should be given.

3892
Brown, E[rnest] B.
PLASMA POTASSIUM CHANGES PRODUCED BY INHALATION OF 30% AND 40% CARBON DIOXIDE IN THE DOG [Abstract]. —— Federation Proceedings, 14 (1, part 1): 21. March 1955. DLC (QH301.F37, v. 14)

Anesthetized dogs exposed to atmospheres of 30% CO_2 in oxygen for 2 hours followed by 40% CO_2 in oxygen for 2 hours exhibited gradual increases in plasma potassium concentrations from a mean of 4.1 mEq./l. at 15 min. to a mean of 5.6 mEq./1. at 2 hours, with a high level persisting thereafter. During the first 5 min. after return to air breathing, a further rise was noted, followed by a gradual decline.

3893
Brown, E[rnest] B.
ROLE OF HYPERKALEMIA IN PRODUCTION OF VENTRICULAR FIBRILLATION FOLLOWING HYPERCAPNIA. — Proc. Soc. Exper. Biol. and Med., 90 (2): 319-323. Nov. 1955. DLC (QP1.S8, v. 90)

The plasma potassium of dogs increased gradually during the breathing of 30% and 40% CO_2 in O_2 for four hours, and increased more sharply to a maximum of 8.2 mM./l. during the first 5 minutes of return to air breathing, gradually decreasing thereafter. Two of 13 dogs in this group died in ventricular fibrillation after the return to air

breathing. When KCl was administered by intravenous drip during CO_2 or air breathing, levels of 12.98-14.39 mM. K/l. were reached before cardiac arrest or ventricular fibrillation occurred. Thus the potassium increase normally occurring during hypercapnia was not sufficient alone to produce cardiac arrest. To test the role of a rapid fall in CO_2 tension and rise in pH in cardiac arrest, dogs were hyperventilated with 100% O_2 after a plasma potassium level normally occurring during extended CO_2 breathing (8-9 mM./l.) was thought to have been reached by KCl administration during 30 minutes of hypercapnia. Cardiac arrest or fibrillation was observed in these animals at a potassium level of as low as 8.4 mM./l. Previously it had been found that a return to air breathing after 30 minutes of high CO_2 breathing, with potassium presumably remaining at a low level, did not produce arrest or fibrillation. Thus it appears that while neither a hypercapnic increase in plasma potassium, nor a rapid fall in CO_2 tension is sufficient alone to produce cardiac arrest or fibrillation, the two in combination are responsible for the cardiac damage occurring during hypercapnia.

3894
Brown, F[rank] A.,
M. F. Bennett, and C. L. Ralph
APPARENT REVERSIBLE INFLUENCE OF COSMIC-RAY-INDUCED SHOWERS UPON A BIOLOGICAL SYSTEM. — Proc. Soc. Exper. Biol. and Med., 89 (3): 332-337. July 1955.
DLC (QP1.S8, v. 89)

The response of the pigmentary system of fiddler crabs to increased showers of cosmic-ray origin was studied by placing lead screens of 0.3 to 2.1 cm. thickness 5 inches from the animals. A definite increase in pigment concentration or body lightening during the early morning hours, and an increase in pigment dispersion or body darkening during the remainder of the day were noted in exposed animals when compared with controls. During both periods a trend towards reversal of the normal melanophore activity was seen.

3895
Brown, Frank A.,
H. M. Webb, and M. F. Bennett
PROOF FOR AN ENDOGENOUS COMPONENT IN PERSISTENT SOLAR AND LUNAR RHYTHMICITY IN ORGANISMS. — Proc. Nat. Acad. Sci. U. S. A. 41 (2): 93-100. Feb. 1955. DLC (Q11.N26, v. 41)

By transportation of fiddler crabs 51° westward (from Woods Hole, Massachusetts, to Berkeley, California) within a 24-hour daily period, it was possible to determine the approximate degree of precision of the capacity of the animals to maintain 24-hour daily and 24.8-hour lunar cycles of color change while no concurrent physical cycle of the same length could be affecting the animals. Compared with control animals kept in Woods Hole, the Berkeley crabs during six days of observation exhibited cycles shifted to a slightly later time in the day, the average shift for eleven morning and evening transitional points being 22 minutes forward. There appeared to be no tendency for any further drift in the cycles of the California crabs away from the controls in Woods Hole; the animals averaged relatively precise 24-hour cycles during the six-day period in each of the two sites. The variations in the form of the daily cycles, owing at least in part to the possession of a simultaneous persistent tidal rhythm, continued to bear the same temporal relationships to the daily in the Berkeley crabs that they bore to the daily in the Woods Hole ones. Although the cause of the 22-minute shift between the two groups is undetermined, it appears clear that the change in rhythm did not follow the change in solar time resulting from the east-west transport. (Authors' summary, modified)

3896
Brown, Fred R.,
and W. L. Lovejoy
CURRENT DEVELOPMENTS IN IMPROVING COCKPIT INFORMATIONAL PRESENTATIONS. — Jour. Aviation Med., 26 (5): 413-416. Oct. 1955.
DLC (RC1050.A36, v. 26)

In the interim phase of the Navy program for the human engineering of data presentation, significant developments have occurred in miniaturizing instruments, integrating displays, improving legibility and interpretability, laying out cockpits for easier pilot functioning and accommodating the cockpit to the visual requirements of high speeds and high altitude. New forms of instrument lighting are being tried to improve this aspect of display. This is a progress report, discussing the planning, development, and testing which provide the basis for progress. (Authors' summary, modified)

3897
Brown, G. Malcolm.,
R. E. Semple, C. S. Lennon, G. S. Bird, C. W. Baugh, and H. C. E. Gasmann
PHYSIOLOGICAL ADJUSTMENTS TO ACUTE COLD EXPOSURE IN ESKIMOS AND WHITE MEN. — Federation Proceedings, 14 (1[I]): 322-323. March 1955. DLC (QH301.F37, v. 14)

Male Eskimos and whites were subjected during summer months to a cold stress by immersion of the right hand and forearm in a 5° C. water bath for 1 hour. Average O_2 consumption and CO_2 output increased to a similar extent in both groups, but remained elevated during a 40 minute recovery period only in the white group. The respiratory quotient rose in both groups. Eskimos showed a greater reduction in plasma volume, hemoconcentration, better maintenance of rectal temperature and muscle temperature in calf, thigh, and left forearm, no change in the skin temperature of the back, and a greater decrease in the skin temperature of the unexposed hand and forearm. Whites showed no hemoconcentration until the recovery period, and a rise in the skin temperature of the back during exposure to cold.

3898
Brown, J. R.,
and P. F. Taylor
CIRCULATORY REACTIONS TO POSTURAL CHANGE AS AN INDEX OF HEAT STRESS [Abstract]. — Jour. Physiol. (London), 127 (3): 55P-56P. March 28, 1955. DLC (QP1.J75, v. 127)

The Crampton index of circulatory efficiency, based on changes in pulse rate and systolic blood pressure during the change from a stable recumbent position to an erect position, was determined in resting and working subjects under varying con-

ditions of heat, humidity, and air movement (collectively expressed as effective temperature). A significant correlation was observed between changes in the index and in effective temperature and sensations of heat and humidity. The use of the index in the evaluation of alterations in the physical condition of subjects exposed to heat and high humidity is suggested.

3899
Brown, John
MAN IN SPACE. — Flight (London), 68 (2430): 269-270. Aug. 19, 1955. DLC (TL501.F5, v. 68)

A brief review of space-flight phenomena is presented. Topics considered are acceleration, temperature, cosmic radiation, meteor bombardment, and psychological adaptation.

3900
Brown, John L.,
and M. Lechner
ACCELERATION AND HUMAN PERFORMANCE: A SURVEY OF RESEARCH. — Univ. of Pennsylvania, Philadelphia; issued by Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5503, March 22, 1955. ii+39 p. (Project Report no. NM 001 111, Report no. 1). AD 59 257 UNCLASSIFIED

This report summarizes the important research which has been conducted to date on the problem of human performance under acceleration. The material has been grouped according to five major headings: the senses, simple motor behavior, complex tasks, cognitive processes, and psychological effects. Research relevant to each of these classifications is reviewed, important questions which appear to remain unanswered are raised, and suggestions are made regarding desirable lines of future research. It appears that only a very limited amount of research has been conducted relating to actual performance sequences which may be required of pilots exposed to acceleration. (Authors' abstract) (98 references)

3901
Brown, Robert H.
THE LUMINANCE THRESHOLD FOR THE VISUAL DISCRIMINATION OF MOVEMENT AS A FUNCTION OF THE SPEED AND EXTENT OF MOTION [Abstract]. — Amer. Psychologist, 10 (8): 444-445. Aug. 1955. DLC (BF1.A55, v. 10)

Four subjects with normal visual acuity observed a spot of light moving at a uniform speed from the center to the periphery of the dark circular fixation area. The subject reported its direction, right or left. The experimenter measured the luminance threshold by the limits for this discrimination. During an experimental session the extent was constant and the luminance threshold was measured over a wide range of speeds. Extent and speed were the major variables affecting the threshold for discrimination of movement. When the threshold luminance was plotted against speed of motion the luminance was constant up to a critical rate beyond which it increased directly with stimulus speed. The extent of motion operated as a parameter determining the locus of the function.

3902
Brown, Robert H.
VELOCITY DISCRIMINATION AND THE INTENSITY-TIME RELATION. — Jour. Optical Soc. Amer., 45 (3): 189-192. March 1955. DLC (QC350.Q6, v. 45)

The hypothesis is advanced that the direct perception of motion in a middle range of speeds involves a single sensory event dependent on the intensity-time relation. Four subjects discriminated velocity at different speeds for each of eight durations of exposure. The minimal luminance required for correct judgments of direction was measured by the method of limits. The data indicate that velocity discrimination occurs at intermediate speeds when the energy of the stimulating flash is constant. The reciprocity relation does not hold for exposures longer than a critical duration of 0.1 sec. The luminance of the flash tends to be the sole limiting factor on velocity discriminations at longer durations of exposure. Implications of these results are discussed with reference to other experiments. (From the author's abstract)

3903
Brožek, J.,
E. A. Fleishman, S. Harris, F. M. Lassman, and J. H. Vidal
SENSORY FUNCTIONS AND MOTOR PERFORMANCE DURING MAINTENANCE ON SURVIVAL RATIONS [Abstract]. — Amer. Psychologist, 10 (8): 502. Aug. 1955. DLC (BF1.A55, v. 10)

The intake of a diet consisting of 1010 cal./day in carbohydrates for 24 days by young men was associated with only small or no deterioration in motor functions, vision and hearing.

3904
Brückner, R.
[ON COMPARATIVE TESTS OF VISUAL ACUITY IN BASEL AND AT ST. MORTIZ] Über vergleichende Sehschärfeprüfungen in Basel and St. Moritz-Bad. — Ophthalmologica (Basel), 128 (6): 389-402. Dec. 1954. In German, with English Summary (p. 402). DNLM

Comparative tests of visual accommodation were made with 10 elderly subjects and 5 younger control subjects in Basel and in St. Moritz (1800 m.). The results observed showed no significant improvement of the angular retinal accommodation during 8 days continuous influence of high altitude. (Author's summary, modified).

3905
Bruell, J. H.,
G. W. Albee
NOTES TOWARD A MOTOR THEORY OF VISUAL EGOCENTRIC LOCALIZATION. — Psychol. Rev., 62 (5): 391-400. Sept. 1955. DLC (BF1.P7, v. 62)

From an examination of empirical data relating to visual egocentric localization, two hypotheses were derived to account for the perception of direction and for some phenomena of egocentric apparent movement. Hypothesis 1 states that when dextro- or levorotators of the eye receive voluntary innervation, the space values for points on the retina change in relation to the direction and degree of innervation. Corresponding changes of retinal space values occur with voluntary innervation of the elevators and depressors of the eye.

Hypothesis 2 states that when eye position is determined by reflex innervation alone, retinal points do not change their space values. Factors responsible for voluntary and reflex innervation of eye turners were examined, permitting the knowledge of patterns of innervation under various stimulus conditions. Predictions from the hypotheses concerning the effects of voluntary and reflex innervation on space perception were compared with empirical data and were found tenable for a variety of perceptual experiences. (From the authors' summary)

3906
Brunaud, M.
[ARTIFICIAL HIBERNATION IN THE ANIMAL] L'hibernation artificielle chez l'animal. — Revue de pathologie generale et comparée (Paris), 55 (669): 892-914. June 1955. In French, with English summary (p. 913). DNLM

A discussion is presented of: (1) the methods of induction of hypothermia, including exposure to cold, modification, of respiratory exchange by hypoxia or hypercapnia, and administration of derivatives of phenothiazine (chlorpromazine) or ergot alkaloids (hydergine); (2) the central and peripheral action of chlorpromazine and its effect on the efferent pathways of the sympathetic nervous system; and (3) the effects of hypothermia on thermogenesis, the heart, blood, circulation, and the endocrine glands. It is concluded that the difficulties encountered in experimental hypothermia discount at present its therapeutic use on the larger domestic animals.

3907
Bugelski, B. R.
POPULATION STEREOTYPES IN PEDAL CONTROL OF A "BALL BANK" INDICATOR. —Jour. Applied Psychol., 39 (6): 422-424. Dec. 1955. DLC (BF1.J55, v. 39)

Sixty-four young male college students were asked to press simulated rudder pedals to center ball-type indicators. One indicator was a simulated ball inclinometer. The other was one with the standard tube inverted and more angular. The subjects failed to approach even a chance distribution of correct responses in using either instrument. The differences from chance are highly significant. It is concluded that the present aircraft instrument offers a display which is contrary to the population stereotype and invites erroneous responses from untrained subjects. The reactions of the subjects support the conclusion that the population stereotype for pedal action in centering off-center indicators is to use the foot opposite to the direction of displacement. (Author's summary)

3908
Burch, N. R.,
T. H. Greiner, and E. G. Correll
AUTOMATIC ANALYSIS OF ELECTROENCEPHALOGRAM AS AN INDEX OF MINIMAL CHANGES IN HUMAN CONSCIOUSNESS [Abstract]. — Federation Proceedings, 14 (1[1]): 23. March 1955. DLC (QH301.F37, v. 14)

A new method for the analysis of electroencephalograms recorded on magnetic tape automatically extracts period information from both the primary EEG trace and its mathematical derivative, utilizing baseline cross points as the coding signal. This method shows individual wave symmetry and sequence as well as major periodic components over any desired interval. Results of this analysis show progressive change of the EEG in conventionally altered states of consciousness, such as sleep, hypoxia, and metrazol activation. Sequential period analysis is more sensitive than classical amplitude-time interpretation to aperiodic phenomena such as those seen in minimal changes of consciousness. (From the Authors' abstract)

3909
Bureau of Medicine and Surgery
AVIATION MEDICINE PRACTICE. — Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. v+288 p. DLC (RC1062.U52)

A collection of papers on aviation medicine. The individual articles are abstracted separately; see item no. 3761, 4205, 4206, 4257, 4277, 4451, 4567, 4590, 4695, 4783, and 4979.

3910
Burgess, B. F.,
C. F. Gell, and D. Cranmore
THE SODIUM AND POTASSIUM CONTENT OF BRAIN AND MUSCLE OF RATS SUBJECTED TO HIGH ACCELERATION. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5513, Dec. 5, 1955. v+16 p. (Project NM 001 100 312, Report no. 1). AD 81 802 UNCLASSIFIED

Rats were subjected to an accelerative stress pattern consisting of a twenty-second exposure to 20 positive g followed by a one minute rest period. This procedure was continued for one hour allowing each animal to receive an average of 40 exposures to this sublethal stress. Upon completion of the stress pattern, the animals were decapitated and the entire brain and a section of the rectus femoris muscle were removed and analyzed for their sodium and potassium contents. A significant decrease in muscle and brain potassium was observed. Brain sodium remained unchanged, whereas a significant increase in muscle sodium was noted. In one series of rats a sublethal intraperitoneal injection of sodium amytal was given three minutes prior to decapitation. In contrast to the unanesthetized series, this group showed an increase in brain potassium in the stressed animals. In all other respects, however, this series resembled the group receiving no anesthesia. (From the authors' abstract)

3911
Burns, H. L.
MECHANICAL RESISTANCE IN BREATHING SYSTEMS: A THEORETICAL ANALYSIS. — Engineering Clinic, Portland, Oregon (Contract AF 33(616)-2272); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-218, June 1955. iii+5 p. (Project no. 7160). AD 90 896 UNCLASSIFIED

A theoretical analysis of pressure-flow characteristics of various components of a representative breathing system demonstrates that opening and shut-off pressures of valves and regulators are the principal factors which determine the magnitude of pressure differential at moderate rates of pulmonary ventilation. The effects of altitude and orifice size on resistance to air flow are also shown. (Author's abstract)

3912
Burton, A. C.,
R. A. Snyder, and W. G. Leach
DAMP COLD VS. DRY COLD: SPECIFIC EFFECTS OF HUMIDITY ON HEAT EXCHANGE OF UNCLOTHED MAN. — Jour. Applied Physiol., 8 (3): 269-278. Nov. 1955. DLC (QP1.J72, v. 8)

Nine subjects lying unclothed were exposed to temperatures of 48° and 58° F., with low (30%) and high (80%) relative humidity for 90 minutes. Skin temperatures, measured in several body regions, showed a gradual decrease which was much the same whether the humidity was high or low, showing a difference of less than 0.3° C. for all points except the thorax, where at 48° F. the temperature was 1.3° C. higher in the dry than in the humid condition. Rectal temperatures, however, rose slightly more in low than in high humidity. Shivering and sensations of cold were both markedly greater in low humidity at both temperatures. The degree of vasoconstrictor response was perhaps slightly greater (except for the thorax) at low humidities. It is suggested that the paradox of a greater sensation of cold and metabolic response at low humidities without apparent correlation to skin temperatures or heat loss may be explained by the uptake of moisture in the skin at high humidities, resulting in reduced temperature differentials in the region of the receptors.

3913
Burton, A. C.,
and O. G. Edholm
MAN IN A COLD ENVIRONMENT: PHYSIOLOGICAL AND PATHOLOGICAL EFFECTS OF EXPOSURE TO LOW TEMPERATURE. — xiv+273 p. London: Edward Arnold Ltd., 1955. DLC (QP82.B87)

A treatise of the physiological and pathological effects of cold exposure on man includes the following chapters: (1) homeothermy and history; (2) the problem of the homeotherm, the heat-balance and physical laws; (3-5) the thermal insulation of the air, clothing or fur, and body tissues; (6) the possibilities of maintaining a thermal steady state in the cold; (7) the estimation of the thermal demand of the environment; (8) vascular reactions to cold; (9) the metabolic response to cold; (10) acclimatization to cold; (11) hypothermia and resuscitation; (12) local cold injury; and (13) problems for future research. (348 references)

3914
Burton, A. C.,
W. G. Leach, and R. A. Snyder
A SPECIFIC EFFECT OF HUMIDITY ON THE PHYSIOLOGICAL RESPONSES TO COLD OF UNCLOTHED MEN [Abstract]. — Federation Proceedings, 14 (1, part 1): 24. March 1955.
DLC (QH301.F37, v. 14)

Nine unclothed, resting subjects were exposed to temperatures of 48° F. and 58° F. for 2 hours at relative humidities of 80% or 30%. Skin temperatures, total heat loss, pilomotor response, and degree of vasocontriction were unaffected by high humidity. The "heat debt" from body-cooling decreased with lower humidity, while shivering and sensations of cold increased.

3915
Buskirk, E.,
J. Brožek, F. Grande, J. T. Anderson, and H. L. Taylor
SEMISTARVATION AND PERFORMANCE CAPACITY [Abstract]. — Federation Proceedings, 14 (1^1): 24. March 1955. DLC (QH301.F3, v. 14)

The effect of 24 days of semistarvation on physical performance was studied in 13 men ingesting a carbohydrate diet of 1010 calories per day. Aerobic work pulse rates, counted during the last 5 minutes of the one hour treadmill walk, decreased from a control value of 131 to 128 beats/minute at 24 days of semistarvation. Harvard Fitness Test scores decreased 12.5% relative to the control value at 4 days of semistarvation. Between the fourth and tenth day, the score increased 70% of the fourth day value. The last 10 days produced a decline to a point 10% above the control value. During rehabilitation the score did not return to the highest point reached during semistarvation. The maximal oxygen intake declined from 3.88 to 3.21 liters/minute. Grip strength as measured by a hand dynamometer showed no change. Only a small impairment of the capacity to perform physical work was noted during the experiment even though the men lost 7.5 kg. of weight and 119 g. of nitrogen. (From the authors' abstract)

3916
Calkins, K.
LOW-DOWN ON HIGH UP. — Boeing Mag., 25 (5): 3-5. May 1955. DLC (TL724.5.B6B6, v. 25)

The construction and equipment of the Boeing Airplane Company's Strato-Trainer, essentially a modified decompression chamber, are described. Ascents in the trainer are an important part of flight test crew training in that they are aimed at revealing individual susceptibility to hypoxia and aeroembolism. In addition to physiological checking, the trainer is used to familiarize the crew with oxygen equipment and escape and survival techniques.

3917
Callaghan, E. E.,
and W. D. Coles
INVESTIGATION OF JET-ENGINE NOISE REDUCTION BY SCREENS LOCATED TRANSVERSELY ACROSS THE JET. — National Advisory Committee for Aeronautics, Washington, D. C. NACA Technical Note 3452, May 1955. 27 p.
DLC (TL521.A35, no. 3452)

An investigation of screens located transversely across a jet as a noise-reduction device was conducted on a full-scale turbojet engine. The screens lowered the sound pressure levels rearward and increased them in front resulting in a nearly circular, nondirectional sound field. The sound power level was lowered by as much as 7.5 decibels by the proper screen choice and location, and, in addition the maximum sound pressure level was decreased approximately 12 decibels over that of the engine alone. (Authors' abstract)

3918
Camp, R. T.
THE EFFECT OF A DIVIDING NETWORK ON SPEECH RECEPTION. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medi-

cine, Pensacola, Fla. Joint Project Report no. 52, May 30, 1955. iii+13 p. (Project no. NM 001 104 500). AD 91439 UNCLASSIFIED

The effect on speech reception of listeners receiving the identical full speech spectrum in both ears (diotic listening) was compared to the effect on speech reception of listeners receiving the high-frequency components above 1650 c.p.s. in one ear and the low-frequency components below 1650 c.p.s. in the other (dichotic listening) in the presence of 114 db. of simulated aircraft noise. A comparison was also made of three headphone arrangements or speech spectra under the dichotic condition. In general, those listeners who listened dichotically earned better reception scores than those who listened diotically. Two of the three speech spectra under the dichotic condition yielded scores significantly different from each other. (Author's abstract)

3919
Campbell, B.
RESEARCH ON THE BIOLOGICAL EFFECTS OF THE HEAVY PARTICLE COSMIC RAYS. — Univ. of Minnesota, Minneapolis: issued by Holloman Air Force Base, N. Mex. Report no. HADC-TR-55-8, Dec. 1955. iii+13 p. AD 80 285 UNCLASSIFIED

Histologic examination of tissue sections from the brains of hamsters exposed to cosmic radiation during single high-altitude balloon flights failed to reveal any lesion which could be ascribed to heavy-particle cosmic rays. Further study is indicated, since the material obtained was not adequate for negative evaluation. An attempt to develop a useful model of heavy-particle cosmic-ray exposure by the acceleration of deuterons on the 184" cyclotron was unsuccessful.

3920
Campbell, C. J.,
L. J. McEachern, and E. Marg
FLIGHT BY PERISCOPE. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-142, March 1955. vi+12 p. (RDO no. 696-67). AD 75 974 UNCLASSIFIED

As a possible solution to the problem of providing external vision in some high-performance aircraft, a binocular aircraft periscope was constructed and flight-tested. The periscope provided a 70° true field of view at a magnification of 1x and incorporated mechanically operated azimuth and declination prisms capable of scanning 180 degrees. Flight instruments were included in the field of view. The periscope was installed in the nose of a B-17 aircraft in conjunction with a unique method of flight control. Twenty impartial USAF pilots carried out routine flight operations competently. Flight by this type of periscope is feasible even by subjects with minimal training. (Authors' abstract, modified)

3921
Campbell, E. J. M.,
and J. H. Green
THE BEHAVIOUR OF THE ABDOMINAL MUSCLES AND THE INTRA-ABDOMINAL PRESSURE DURING QUIET BREATHING AND INCREASED PULMONARY VENTILATION: A STUDY IN MAN. — Jour. Physiol. (London), 127 (2): 423-426. Feb. 28, 1955. DLC (QP1.J75, v. 127)

Intra-gastric pressure and abdominal muscle activity in the erect posture were examined in healthy young men during quiet breathing and during increased ventilation induced by rebreathing expired air or, at ventilation rates above 60 liters/min., by voluntary effort. A continuous muscular activity was noted during quiet breathing which increased in intensity during expiration and decreased during inspiration. The activity was abolished in most cases by adjustment of the stance. As pulmonary ventilation increased, a definite respiratory rhythm was established, with cessation of activity during inspiration and increased activity during expiration. Intra-gastric pressure during quiet respiration rose slightly with inspiration and fell with expiration. Above a ventilation rate of 40 l./min., the pressure during expiration increased until at 76 l./min. it exceeded the level of pressure during inspiration. It is concluded that the abdominal muscles do not have a significant expiratory role in the erect posture except at very high levels of pulmonary ventilation. (Quoted in part)

3922
Campbell, H. E.
PREVENTION OF INJURIES IN AIRPLANE AND AUTOMOBILE ACCIDENTS. — Jour. Amer. Med. Assoc., 157 (11): 945. March 12, 1955. DLC (R15.A48, v. 157)

Injuries occurring during airplane accidents may be prevented by using: (1) seats equipped with safety belts to control vertically acting forces; (2) rearward seating in which the seat back is extended well above the head to protect the passenger from contact with falling roof elements, and (3) side-wings and arm rests integral with the seat back to protect the passenger from fatal injuries by being hurled by lateral forces against the relatively sharp and rigid arm rest.

3923
Campbell, P. A.
AEROMEDICAL AND BIOLOGICAL CONSIDERATIONS OF FLIGHT ABOVE THE ATMOSPHERE. — Jour. Brit. Interplanetary Soc. (London), 14 (1): 1-12. Jan.-Feb. 1955. DLC DLC (TL790.A1B7, v. 14)

Basic biological problems arising from the trend toward flight above the atmosphere are discussed under three primary categories: (1) those associated with the attainment of high speed and penetration of the atmosphere at those speeds; (2) those resulting from loss of the life-sustaining qualities of the earth's atmosphere; and (3) those resulting from loss of protection afforded by the filtration qualities of the atmosphere. (Author's summary, modified)

3924
Campbell, P. A.
AERO-OTOLOGY. — In: Otolaryngology, vol. 2 (28). Ed. by S. M. Coates and others. 24 p. Hagerstown, Md.: W. F. Prior Co., 1955. DNLM (WV100.C6520)

Otitic barotrauma (aerotitis) is defined as those acute or chronic pathological alterations of the structures of the middle ear produced by a pres-

sure differential between the air or gas in the tympanic cavity and associated pneumatic spaces and the surrounding atmosphere. Discussion is presented on its synonyms, history, etiology, prophylaxis, pathology, symptoms, clinical aspects, audiometric findings, diagnosis, and treatment. Aircraft noise is considered as it affects the auditory apparatus causing temporary hearing loss and difficulties in communication. Noise protection in most aircraft may be achieved by insulation placed between inner and outer walls, and the wearing of helmets and cotton plugs. Mention is made of the vestibular responses to flight, and the etiology and pathogenesis of airsickness is noted. (32 references)

3925
Campbell, P. A.
SINUS BAROTRAUMA.— In: Otolaryngology, vol. 3 (12). Ed. by S. M. Coates and others. 11 p. Hagerstown, Md.: W. F. Prior., 1955.
DNLM (WV100. C6520)

A general discussion of sinus barotrauma (aerosinusitis) is presented with emphasis on definition, synonyms, incidence, etiology, pathology, symptoms, diagnosis, pathogenesis, complications, and treatment.

3926
Capek, D.
[PHYSIOLOGY OF THE AVIATOR] Fysiologie letce. — 2nd. ed. 379 p. Praha: Nase vojsko. 1953. In Czech. DLC (RC1075. C3)

The following chapters are included in a book dealing with the physiological and psychopathological aspects of flying: (1) the environment of the aviator; (2) physiological and pathological effects of high altitude flying (effects of reduced atmospheric pressure and reduced partial pressure of oxygen, chronic effects of hypoxia, acclimatization, metabolism, explosive decompression); (3) effects of acceleration; (4) motion sickness; (5) effects of cold, wind, vibration, noise, and sun blindness; (6) toxic effects of carbon monoxide, fuel, oxygen, and sulphonamides; (7) aircraft accidents and emergencies; (8) parachute jumps; (9) aerial transportation of wounded and sick; (10) effects of stress, and (11) the physician's role and duties in air units. (202 references)

3927
Caplan, H.
THE INVESTIGATION OF AIRCRAFT ACCIDENTS AND INCIDENTS: AN INTRODUCTORY STUDY. — Jour. Royal Aeronaut. Soc. (London), 59 (529): 45-60. Jan. 1955. DLC (TL501.R7, v. 59)

A conceptual analysis of the investigation of air accidents includes an outline and discussion of (1) the purpose of investigation, (2) requirements of the "ideal" investigation, (3) investigating bodies (state, aircraft operator, manufacturer, insurer), (4) characteristics of an accident which require that it be investigated, (5) methods of investigation, and (6) the nature and significance of human error (prejudice against error, means for exploring human failure). Suggestions are offered for a new approach to accident investigation designed to strengthen the link between the occurrence of an accident and a resulting improvement in air safety.

3928
'CAPSULE' TO TEACH HOW TO EJECT. — Aviation Week, 62 (16): 101. April 18, 1955.
DLC (TL501.A8, v. 62)

An ejection seat "capsule trainer" being built by Carmody Corp. for the Air Force is described. The trainer contains all necessary information charts and a working model of the seat and associated mechanisms in an easily transportable package which can be quickly set up for pilot instruction.

3929
Carenini, B. B.
[STUDIES ON THE BEHAVIOR OF THE STEREOSCOPIC SENSE (BY MEANS OF THE WIRT TEST) IN CONDITIONS OF A MODIFIED OXYGEN SUPPLY TO VISUAL APPARATUS] Ricerche sul comportamento del senso stereoscopico (al test di Wirt) in condizioni di modificato apporto di ossigeno all'apparato oculare. — Rivista di medicina aeronautica (Roma), 18 (3): 754-770. July-Sept. 1955. In Italian, with English summary (p. 768). DLC (TL555.A1R5, v. 18)

Wirt's test was used to evaluate the stereoscopic vision of 50 normal subjects between 18 and 36 years of age under hypoxic conditions. Hypoxia induced by breathing a mixture of 14.5% oxygen in nitrogen, corresponding to a simulated altitude of 3,000 meters (10,000 feet), did not reduce the initial values of the stereotest: on the contrary, it produced an increased value in 10 out of the 50 subjects. Hypoxia induced by mixtures of 19.7% and 7.35% oxygen in nitrogen, corresponding to altitudes of 6,000 and 8,000 meters (19,000 and 26,500 feet), respectively, caused a decrease in stereoscopic acuity of about one half in all subjects, the others showing no significant change. The administration of pure oxygen at atmospheric pressure normalized stereotest values in subjects with initial normal stereoscopic acuity. The mechanism of action of hypoxia and hyperoxia in stereoscopic acuity is briefly discussed.

3930
Carlson, D. C.
HEAT PRODUCTION AND COLD ADAPTATION [Abstract]. — Federation Proceedings, 14 (1[I]): 26. March 1955. DLC (QH301.F37, v. 14)

The ability to maintain both core and peripheral temperature in the face of severe cold stress was studied in the rabbit by measuring core (rectal and deep muscle) and extremity (ear) temperature, oxygen uptake and muscle activity (electromyogram). The time relationships indicate that the adapted animal responds quickly with an increase in metabolism if the rate of cooling is high, and that this response is concurrent with increased electrical activity in muscles. The electromyogram of the muscles of cold-adapted animals is distinctly different from that of unadapted animals. (From the author's abstract)

3931
Carlson, L. D.
CHANGES IN PERIPHERAL CIRCULATION WITH EXPOSURE TO COLD. — In: Peripheral circula-

tion in man, p. 92-104. Ed. by G. E. W. Wolstenholme and J. S. Freeman (Ciba Foundation Symposium.) Boston: Little, Brown and Co., 1954. DLC (QP101. C52)

Experimental evidence, though of circumstantial nature, indicates that a readjustment in circulation is involved in adaptation to cold. The adapted person tends to keep extremities warmer. This allows the adapted person to endure the exposure to cold with less discomfort and loss in manipulatory efficiency. Mechanisms for this change may be postulated, but the exact description awaits experimental proof. Maintenance of the extremities at relatively higher temperatures gives rise to greater heat loss. The area involved is not great. There is evidence of slight changes in trunk temperature so that little increase in total heat loss occurs. (Author's conclusion)

3932
Carp, A.,
S. Mastropaolo
AN EVALUATION OF A TRAINING PROGRAM FOR LIMITED APTITUDE AIRMEN [Abstract]. — Amer. Psychologist, 10 (8): 479-480. Aug. 1955. DLC (BF1.A55, v. 10)

One thousand airmen whose aptitude indexes on the Airman Classification Battery were Stanine 3 or below were subjects of this study. Five hundred of these were given a 6-week basic training program and 500 a 12-week basic training program. The short course eliminated arithmetic and language arts while the long course included 45 hours of instruction in each. There were no important differences between the two groups either at the end of basic training, 6 weeks, or 8 months on-the-job in aptitude test scores, achievement test scores, or indices of job performance. Differences were minimal, as well, on language and arithmetic achievement tests. The prediction of a composite criterion of on-the-job performance from aptitude, achievement, interest, and biographical data yielded essentially negative results.

3933
Carter, E. T.
CARBONIC ANHYDRASE INHIBITION DURING HYPOXIA [Abstract]. — Federation Proceedings, 14 (1[1]): 26. March 1955. DLC (QH301.F37, v. 14)

Dogs were acutely exposed to a barometric pressure of 350 mm. Hg in a decompression chamber. Diamox, carbonic anhydrase inhibitor, was administered intravenously (100 mg./kg.) before decompression in one series of runs and after decompression in another series. The following observations were made: (1) arterial oxygen tension was decreased less following decompression in animals previously treated with Diamox; (2) arterial oxygen tension increased when Diamox was given after a steady state at altitude was obtained; (3) alveolar carbon dioxide tension decreased more during ascent with Diamox than without it; (4) alveolar carbon dioxide tension decreased when Diamox was given after a steady state at 350 mm. Hg was obtained; (5) Diamox-treated dogs manifested a higher ventilation equivalent for carbon dioxide at 350 mm. Hg than controls at the same altitude; (6) Diamox-treated animals showed a greater decrease in arterial carbon dioxide content after ascent than did controls, and (7) no difference was noted in the respiratory quotient of expired air between control and treated animals. (From the author's abstract)

3934
Carterette, E. C.
PERSTIMULATORY AUDITORY FATIGUE FOR CONTINUOUS AND INTERRUPTED NOISE. — Jour. Acoust. Soc. Amer., 27 (1): 103-111. Jan. 1955. DLC (QC221.A4, v. 27)

Five subjects made median-plane localizations (loudness balance) of a continuous 90-db. 100-5000 c.p.s. band-pass noise before, during, and after a seven-minute exposure of one ear to fatiguing stimuli. These stimuli were continuous noises at four sound pressure levels (30 to 100 db.) with 1 to 12.5 interruptions per second and at a noise-time fraction of 0.5. It was found that (a) the time required for fatigue to reach an apparent asymptote in noise is at least seven minutes, or about twice that required for pure tones; (b) maximum fatigue increases with the intensity of the fatiguing stimulus; (c) for a fixed intensity of fatiguing noise the maximum fatigue for the highest rate of interruption is less than that obtained with a continuous noise having the same over-all level; and (d) during fatigue the between-observer balance variation tends to be greater than the within-observer variation; the reverse is true for the post-fatigue period. (From the author's abstract)

3935
Cathcart, E. S.,
and I. T. D. Williams
THE EFFECT OF THE HEAD-DOWN POSITION ON THE EXCRETION OF CERTAIN URINARY CONSTITUENTS. — Clinical Sci. (London), 14 (1): 121-124. 1955. DNLM

No significant changes in the excretion of water, chloride, total mols, or creatinine were observed in 6 of 7 subjects tilted in a 12° head-down position during a period in the diurnal rhythm when urinary volume was stable or decreasing. It is considered unlikely that changes in venous pressure in the kidneys or head are responsible for these changes in salt and water excretion.

3936
Cattell, R. B.
PSYCHIATRIC SCREENING OF FLYING PERSONNEL: PERSONALITY STRUCTURE IN OBJECTIVE TESTS: A STUDY OF 1,000 AIR FORCE STUDENTS IN BASIC PILOT TRAINING. — Univ. of Illinois, Urbana; issued by School of Aviation Medicine, Randolph Field, Tex., June 1955. 50 p. (Project no. 21-0202-007, Report no. 9), AD 79 327 UNCLASSIFIED

Personality factors were measured by 61 tests (11 individual tests, 50 group tests) in a sample population of 1,000 Air Force basic pilot training students. Among the 123 personality variables obtained, the number of significant correlations far exceeded that expected on chance alone. Two independent factor analyses were carried out with different extraction methods and independent blind rotations, to an adequate criterion of simple structure on two distinct matrices, one on a sample population of 500 and one on 250. Fifteen matching factors were obtained at confidence levels between 1 and 5 %. Identification of factors was made possible by a previously completed survey on related researches, which yielded a series of approximately 33 factors (18 of the personality factors) considered estab-

lished in individual measurements. Subsequent reports will deal with correlation of these factors with criteria of psychiatric success in the career of military flying. (From the author's summary)

3937 1954
CAUSES OF NONEFFECTIVENESS. — U. S. Air Force Medical Service Digest, 5 (1): 2-25. Jan. 1954. DLC

The major medical causes of noneffectiveness (manpower loss) in U. S. Air Force personnel were determined by tabulation of a random sample of individual medical records of cases disposed of during 1951. Acute upper respiratory infections were found to be the most important cause of admission to medical treatment and the second ranking cause of noneffectiveness. Injuries were the most important cause of noneffectiveness with a longer average period of treatment, and were the second leading cause of admission. Other medical causes of noneffectiveness in descending order of importance were musculoskeletal conditions, dermatological conditions, disorders of character, behavior, and intelligence, diseases of the urinary and genital systems, psychoneuroses, ulcers, psychoses, and infectious hepatitis. Psychoses and neuroses accounted for 27% of all disability separations. The death rate was less than one-third that of the civilian population, while the death rate from injuries was relatively high.

3938
Cauwel, G.
[ROLE OF DRINKING IN THE AVIATOR] Rôle de la boisson chez l'aviateur. — Semaine médicale professionnelle et médico-sociale (Paris), 31 (44): 1442-1444. Nov. 30, 1955. In French. DNLM

Following a summary of the principal psychomotor aptitudes indispensible for airplane piloting, and the principal effects of barometric depression, temperature, and acceleration on the body, the toxic effects of alcoholic beverages on the pilot are noted. Included are its effects on nervous equilibrium, mental aptitudes (in combination with anoxia), body temperature regulations and glucide and vitamin metabolism. It is recommended that pilots drink no alcoholic beverages prior to flight duty.

3939
A CENTRIFUGE FOR RESEARCH ON ACCELERATION EFFECTS. — Aircraft Engineering (London), 27 (318): 254-255. Aug. 1955.
DLC (TL501.A5615, v. 27)

The technological design of the man-carrying centrifuge at the R. A. F. Institute of Aviation Medicine is described. The mechanical operation of the centrifuge and its communications, safety, and operation control systems, are considered.

3940
Cerletti, A.,
and A. Fanchamps
[NEUROPLEGIA AND CONTROLLED HYPOTHERMIA: REMARKS ON THE PROBLEM OF "ARTIFICIAL HIBERNATION"] Neuroplegie und kontrollierte Hypothermie: Bemerkungen zur Frage der "künstlichen Hibernation." — Schweizerische medizinische Wochenschrift (Basel), 85 (7): 141-145. Feb. 12, 1955. In German. DNLM

This is a review of the historical development of hypothermia, its physiological effects, the thermoregulation of the organism, various methods of induction of artificial hypothermia, the mechanisms of temperature fall and lowering of the metabolism, and the application of hypothermia.

3941
CERTIFICATION IN AVIATION MEDICINE. — U. S. Navy Med. News Letter, 25 (4): 33-36. Feb. 18, 1955. DNLM

The examination for certification of eligible aviation medical specialists consists of two written examinations, one in preventive medicine and the other in aviation medicine. Subjects covered in the preventive-medicine examination include: biostatics, epidemiology, environmental medicine, ecology, environmental control, physical hygiene, clinical preventive medicine, toxicology, and preventive psychology. The aviation-medical examination deals with: the basic sciences and preventive medicine as applied to aviation medicine; flight medicine including altitude indoctrination; health supervision; escape and survival; diagnosis, treatment, and rehabilitation of flight personnel; aviation psychology including selection and training of personnel; development and usage of flight equipment; special senses and physiological reactions to unusual flight situations, and administrative problems in personnel relationship, principles, standards, and legal aspects. A list is included of books, periodicals, and manuals useful for studies preparatory to the examination.

3942
CHAMBER REACTIONS. — U. S. Air Force Medical Service, 6 (11): 21-22. Nov. 1955. DLC

An untoward physiological reaction occurring, though rarely, during ascent to simulated altitude is the neurocirculatory collapse, in which symptoms of dysbarism usually precede the maximum circulatory or neurological changes, which may or may not be accompanied by loss of consciousness. It should not be confused with collapse due to hypoxia, hyperventilation, excessive positive-pressure breathing, or apprehension. The etiology of neurocirculatory collapse is unknown. All cases of neurocirculatory collapse are to be considered dangerous. Individuals showing signs of decompression sickness, neurological changes, circulatory changes, or any unusual symptoms should be recompressed to ground level as rapidly as possible, watched for two hours, and hospitalized if there are any residual symptoms. Any unusual symptoms should be reported to the flight surgeon for immediate action to prevent the development of serious reactions. Prophylaxis is the preferred treatment.

3943
Chapin, J. L.
COMPARISON OF REBREATHING AND BREATH HOLDING BREAKING POINT CURVES AT 5300 FEET [Abstract]. — Federation Proceedings, 14 (1^{I}): 27. March 1955. DLC (QH301.F37, v. 14)

A comparison was made of breath holding and rebreathing breaking-point curves at altitude with inspired O_2 percentages of 15 to 50%. Rebreathing in all cases produced higher alveolar CO_2 and lower O_2 values than did breath holding. Rebreathing gas

high in oxygen resulted in subjective sensations of marked vasomotor disturbance with sweating. Rebreathing 100% O_2 produced an axillary temperature increase of 0.5%, an increase in ventilation to 66% of maximum breathing capacity, an increase of 41% in heart rate, an increase in systolic blood pressure of 44 mm. Hg, and an increase in diastolic pressure of 16 mm. Hg.

3944
Chase, H. B.,
J. D. M. Bliss, W. E. Straile, and J. S. Post
EFFECTS ON THE SKIN BY COSMIC RAY HEAVY PARTICLES. — Brown Univ., Providence, R. I. (Contract AF33(616)-2085); issued by Holloman Air Development Center, Holloman Air Force Base, N. M. May 1955. iii+7 p. AD 68 166 UNCLASSIFIED

Mice were exposed to cosmic-ray heavy primaries for 17 to 32 hours in stratosphere balloon flights at altitudes above 90,000 feet at Sault Sainte Marie. Controls were flown at comparable altitudes from the lower latitude of Holloman, N. M. Depigmentation of hair, frequently in clusters, as a result of hits from cosmic ray heavies largely of the C, N, and O type was observed. Unexplained is the observation that white hair follicles are pulled out with the hairs when these hairs are later plucked. Ground level studies indicate that small columns exposed to ionizing radiations and surrounded by normal tissues are less sensitive to given doses of irradiation.

3945
Chatonnet, J.,
and M. Tanche
[ACTION OF CHLORPROMAZINE ON THE THERMAL REGULATION OF DOGS EXPOSED TO COLD] Action de la chlorpromazine sur la régulation thermique du Chien exposé au froid. — Comptes rendus de la Société de biologie (Paris), 149 (7-8): 716-719. April 1955. In French. DLC (QP1.S7, v. 149)

The effect of chlorpromazine on temperature changes and rate of thermogenesis (determined by measuring the oxygen consumption) in dogs exposed to temperatures of -20° to +30° C. for 1 to 3 hours was studied. Injection of 2-5 mg. of chlorpromazine per kg. of body weight prevented the normally occurring increase in rectal temperature of 1-1.5° C. at low temperatures, while the oxygen consumption was either unaffected or only slightly lowered. The decrease in body temperature, which occurred at low, but not at normal, ambient temperatures in dogs treated with chlorpromazine, was thus attributed to an increase in thermolysis rather than to a decrease in thermogenesis.

3946
Chatonnet, J.
[THE NEURAL CONTROL OF CHEMICAL THERMOREGULATION] Les commandes nerveuses de la thermoregulation chimique. — Archives des sciences physiologiques (Paris), 9 (4): C103-C111; discussion, p. C112. 1955. In French. DNLM

A review is presented of experimental observations on heat production in the body by control of the metabolic activity of individual organs, induction of unspecific responses to emergencies, particularly cold, and control of the metabolic level of the cells. The principal centers of thermogenesis are discussed, including the liver, the regulatory mechanism of which is undetermined, and the muscles, which produce heat by an increase in tone or by shivering. Studies are described of the control of muscular thermogenesis upon cold exposure after removal of probable sources of regulation, including the medulla and its innervation, the muscular innervation, and the adrenal glands.

3947
Chemin
[THE METHODS OF MEDICO-PHYSIOLOGICAL SUPERVISION OF FLIGHT PERSONNEL] Le modalités de surveillance médico-physiologique du personnel dans l'aviation. — Archives des maladies professionnelles de médecine du travail et de sécurité sociale (Paris), 16 (5): 499-500. 1955. In French. DNLM

In France, control of military flight personnel is maintained by requiring an annual medical and physiological examination for pilots and an examination every two years for all other flying personnel. Control of civilian flight personnel is maintained by requiring a medical and physiological examination every six months for pilots and once a year for all other personnel. It is noted that a pilot's license is valid only for a six month period and is not renewable without medical certification.

3948
Chernikoff, R.,
H. P. Birmingham, and F. V. West
A COMPARISON OF PURSUIT AND COMPENSATORY TRACKING UNDER CONDITIONS OF AIDING AND NO AIDING. — Jour. Exper. Psychol., 49 (1): 55-59. Jan. 1955. DLC (BF1.J6, v. 49)

Previous studies have shown that pursuit tracking yields lower error scores than compensatory. This experiment was designed to test the hypotheses that aiding applied to compensatory and pursuit tracking will result in (a) improved performance on both, and (b) no difference in accuracy between the two modes. Six subjects were given six trials daily for ten days on each of the four conditions: (a) compensatory unaided, (b) compensatory aided, (c) pursuit unaided, and (d) pursuit aided tracking. A trial was 1 min. in duration, with the last 45 sec. scored by an error integrator. A course composed of three sine waves was tracked by means of a handwheel control. The following results were obtained: (1) As in previous studies, pursuit tracking resulted in significantly less error than compensatory when no aiding was used ($p < .01$). (2) Aiding materially reduced the amount of error in the compensatory situation ($p < .01$). (3) Aiding applied to the pursuit mode increased the amount of tracking error ($p < .01$). (4) With aiding, there was no significant difference in error between pursuit and compensatory tracking. And (5) pursuit unaided tracking was significantly better than any of the other three conditions. (Authors' summary)

3949
Cheymol, J.,
and C. Levassort
[HYPERTHERMAL AGENTS AND HYPOXIA] Hyperthermisants et hypoxie. — Comptes rendus de la Société de biologie (Paris), 149 (3-4): 338-343. Feb. 1955. In French. DLC (QP1.S7, v. 149)

The effectiveness of the hyperthermal agents antigonococcic vaccine (acting on the thermoregulatory mechanism), dinitrophenol (acting by increasing metabolic activity), and β-tetrahydronaphthyl amine (combined action) in counteracting hypoxic hypothermia was studied. Rabbits were exposed to simulated altitudes of 5,000, 7,000, or 9,000 m. for 7 hours, at a normal ambient temperature of 15-25° C. Continuous measurements of temperature during the period of exposure demonstrated that while β-tetrahydronaphthyl amine had no effect, the antigonococcic vaccine and, to a lesser extent, dinitrophenol, quantitatively counteracted the hypoxic hypothermia.

3950
Cheymol, J.,
M. Leroux, and C. Levassort
[CHANGE IN BLOOD COAGULABILITY IN THE RABBIT DURING HYPOXIA CAUSED BY MODERATE BAROMETRIC DEPRESSION (SIMULATED ALTITUDE, 7,000 METERS)] Modification de la coagulabilité chez le lapin au cours de l'hypoxie par dépression barométrique modérée (altitude fictive: 7,000 mètres). — Bulletin de la Société de chimie biologique (Paris), 37(5-6): 715-721. 1955. In French. DNLM

Rabbits decompressed to a simulated altitude of 7,000 meters for three hours displayed an intense hypercoagulation accompanied by a slight extension of the Quick time. This phenomenon appears to correspond to hyperthromboplastinemia, and is analogous to the modifications observed in man acclimated to high altitudes. It is opposed, by comparison, to the hypercoagulation which is the rule during physiological hibernation. (Authors' summary)

3951
Chief of Naval Operations
NIGHT FLYING SENSE. — Office of the Chief of Naval Operations. Aviation Training Division, Washington, D. C. NAVAER 00-80Q-47, 1955. 43 p. DNLM

A favorable attitude towards night flying is encouraged by a humorous discussion of common sources of anxiety in the pilot inexperienced in night flying. The necessity for night flying and the importance of self-confidence, skill in instrument flying, night vision technique, and use of oxygen are stressed.

3952
Chief of Naval Operations
SURVIVAL TRAINING GUIDE. — Office of the Chief of Naval Operations, Aviation Training Division. Washington, D. C. NAVAER 00-80T-56, Nov. 1955. 3+342 p. DNLM

A survival manual intended as a sourcebook for the preparation of survival lectures and as a textbook for aviators is presented. The manual contains general information on all aspects of survival throughout the world, including (1) the physiological hazards of flight; (2) factors in the decision to abandon flight, the construction and operation of the parachute, and manual and ejection bailout procedures; (3) air rescue techniques and signaling devices; (4) the hazards of fear and of specific plants and animals; (5) first aid and techniques of survival on land and sea, in the Arctic, desert, and in the Tropics; and (5) travel techniques. (225 literature references + 173 film references)

3953
Chiles, W. D.
THE EFFECTS OF SLEEP DEPRIVATION ON PERFORMANCE OF A COMPLEX MENTAL TASK. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-423, Sept. 1955. v+13 p. (Project no. 7193, Task no. 71612). AD 100 691 PB 121369

Data were recorded on the performance of six subjects each of whom was deprived of 30 hours sleep. The task on which these subjects performed required the making of a total of 200 discrete comparisons over a period of approximately 25 minutes. Three such performance periods were used: one at the beginning of the normal working day, a second approximately 24 hours later (no sleep having been permitted in the meantime), and a third approximately six hours after the second session. The performance of these subjects was compared with that of a control group of five subjects who performed the test three times but did so on three separate days, each session having been preceded by a presumably normal night's sleep. The statistical analysis revealed a significant difference between the two groups, i.e., the control group showed significantly more improvement from the second to the third sessions than did the group deprived of sleep. The general conclusion was that subjects who are suffering from loss of sleep do not show the improvement which would be expected on the basis of the performance of control subjects when the fatigued subjects are confronted with a complex mental task which they have not as yet mastered. (Author's abstract)

3954
Chiles, W. D.
EXPERIMENTAL STUDIES OF PROLONGED WAKEFULNESS. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-395, Dec. 1955. v+15 p. (Project no. 7193, Task no. 71612). AD 100 698 PB 121393

Two experiments were carried out concerning the effects of prolonged wakefulness and of fatigue on performance of psychomotor and psychological tasks. The first experiment involved four subjects each of whom sat individually in an aircraft cockpit for 56 hours. During this time, measures of reaction time and alertness were taken, and, at the end of the experiment, two of the subjects flew ILAS passes in a Link trainer. The reaction time and the alertness measures reflected considerable variability in the attentiveness of the subjects. The performance in the Link trainer was judged to be within the limits of acceptability. The second experiment involved the assessment of the effects of 30 hours of wakefulness with continuous work (painting a barracks) on the performance of 15 subjects on a psychological and a psychomotor task. In addition, the effects of two different drugs, d-amphetamine sulphate and cortisone, were compared with those of a placebo. The psychological test involved the summing of rows of figures, and the psychomotor test involved arm-hand steadiness. Each of these tests distinguished, to some extent, the two drug groups from the placebo group. It was concluded that the two drugs improve performance on the additional test, whereas they tend to decrease arm-hand steadiness as a function of time. (Author's abstract)

3955
Chin, N. B.,
and R. E. Horn
INFRARED SKIASCOPIC MEASUREMENTS OF REFRACTIVE CHANGES IN DIM ILLUMINATION AND IN DARKNESS. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-479, Aug. 1955. iv+12 p. (Project no. 7157, Task no. 71808). AD 99 562 UNCLASSIFIED

A brief review of the literature is presented of the causes of night myopia and empty-field myopia. Measurements of the refractive state of the eye in reduced illumination and in darkness were made using an infrared skiascope. In photopic vision, about half of the subjects showed an increase in the refractive state as the illumination was lowered. A few, however, showed a decrease or no change in refraction. Accommodative changes were generally small and variable. In complete darkness nearly all subjects showed an increase in the refractive state with variable accommodation. Discussion is presented on the effect these myopias have on detection of objects near threshold and contrast threshold. Several objections are noted to the use of corrective lenses to nullify the effects of night myopia.

3956
Chinn, H. I.,
R. W. Hyde, and L. J. Milch
EFFECTIVENESS OF VARIOUS DRUGS IN PREVENTION OF AIRSICKNESS: TREATMENT BY INTRANASAL MEDICATION. — School of Aviation Medicine, Randolph Field, Tex. Nov. 1955. 4 p. Report no. 56-6. AD 90 764 UNCLASSIFIED

Scopolamine was administered to subjects aboard aircraft by nasal instillation (nose drops and spray) 15 to 20 minutes after take-off. The incidence of vomiting from airsickness during the subsequent 40 to 45 minutes was markedly reduced. Oral and sublingual administration under these conditions was ineffective. Considerable variations in the amount of drug instilled resulted when given by spray. The use of nose drops allowed more accurate medication. The significance of this mode of administration for treating motion sickness is discussed. (Authors' summary)

3957
Chinn, H. I.,
and P. K. Smith
MOTION SICKNESS. — Pharmacol. Reviews, 7 (1): 33-82. March 1955. DNLM

A review is presented of the literature on motion sickness with emphasis on the following topics: symptoms; incidence; selection of persons resistant to motion sickness; etiology; vestibular factors; central nervous pathway; non-labyrinthine stimuli in motion sickness; and prophylactic and therapeutic measures. Drugs used for protection against motion sickness include parasympatholytics, central nervous depressants, vitamins, antihistaminics, and miscellaneous substances. Side-effects, site, and mechanism of action of these drugs are discussed. (382 references)

3958
Chinn, H. I.,
and Paul K. Smith
THE NEWER THERAPY OF MOTION SICKNESS. — Internat. Record Med., 168 (1): 13-22. Jan. 1955. DLC (R11.M745, v. 168)

The following drugs advocated for the therapy of motion sickness are reviewed: belladona alkaloids; synthetic antispasmodics; barbiturates; vitamins (pyridoxine); antihistaminics (dimenhydrinate, benadryl); phenothiazine derivatives (promethazine), and the piperazine series of antihistaminics. A list of the drugs effective in motion sickness prophylaxis with their average single dose includes: hyoscine hydrobromide: dimenhydrinate (Dramamine): diphenhydramine (Benadryl): meclizine (Bonamine); cyclizine (Marezine); prophenpyramine maleate (Trimeton): promethazine (Phenergan); Parsidol; Trimeton; and pyrathiazine (pyrrolazote). (99 references)

3959
Chinn, H. I.,
R. W. Hyde, and L. J. Milch
PREVENTION AND TREATMENT OF MOTION SICKNESS BY INTRANASAL MEDICATION. — Proc. Soc. Exper. Biol. and Med., 90 (3): 666-669. Dec. 1955. DLC (QP1.S8, v. 90)

The intranasal administration of scopolamine (0.3-0.4 mg.) 30 minutes prior to swinging was found to decrease the incidence and severity of swing sickness. The effectiveness of the drug was increased by addition of a surface-active agent (sodium lauryl sulfate-Duponal C). During flight testing, the administration of scopolamine by nasal spray 15-20 minutes after takeoff reduced the incidence of vomiting during the following 40-45 minutes; oral and sublingual administration was ineffective during this short period. Administration by nose drops was preferred, since administration by nasal spray was found to result in varying individual doses.

3960
Chinn, H. I.,
N. E. R. Pawel, and R. F. Redmond
A SIMPLE MICROMETHOD FOR BLOOD CARBON MONOXIDE DETERMINATION. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-109, July 1955. 4 p. AD 79 985 UNCLASSIFIED

A rapid, simple method for estimating the carbon monoxide content of blood is described. The carbon monoxide is liberated from finger blood by potassium ferricyanide and drawn through a tube containing a carbon monoxide-sensitive chemical. The color change induced is compared with standards prepared at various saturation levels. (AD abstract)

3961
Chinn, H. I.
TRAVEL AND MOTION SICKNESS. — Internat. Record Med., 168 (8): 523-527. Aug. 1955. DLC (R11.M745, v. 168)

Factors determining susceptibility to motion sickness include: (1) the individual's previous experience; (2) age (resistance increases with age); (3) sex (women are more susceptible than men); (4) weight (sensitivity increases with obesity); (5) race (no racial difference is known); (6) the position occupied in the plane (the greatest incidence is found in passengers of left-hand window seats); (7) the type of plane (airsickness is more prevalent in the two-motor smaller aircraft DC-3 than in the four-motor plane DC-4; and (8) the time of day. Most airsickness occurs during daylight hours.

3962
Christensen, H.
[OBSERVATIONS AND REFLECTIONS ON THE BINOCULAR DEPTH PERCEPTION] Observationen und Reflektionen über das binokulare Tiefensehen. — Acta ophthalmologica (Copenhagen), 33 (2): 167-203. 1955. In German. DNLM

On the basis of his own observations the author arrives at an explanation of direct stereoscopic vision, which takes into account the fact that impulses sent out by the corresponding receptors summate before the arrival at the evaluatory centers.

3963
Christensen, J. M., and C. W. Crannell
THE EFFECT OF SELECTED VISUAL TRAINING PROCEDURES ON THE VISUAL FORM FIELD. — Miami Univ., Oxford, Ohio (Contract AF 18 (600)-25); and Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-239, April 1955. iv+26 p. (Project no. 7186). AD 76 423 UNCLASSIFIED

An experiment was performed to examine the possibility of increasing the area of the visual form field through certain training procedures. A comparison was made between training to read groups of digits exposed tachistoscopically and training to perceive single digits exposed to the periphery of the retina. Tests of the effectiveness of these two types of training were made in terms of pretests and posttests of (1) reading speed and accuracy, (2) ability to check-read a panel of simulated aircraft instrument dials exposed tachistoscopically, (3) ability to perceive digits in the peripheral areas, and (4) ability to transfer the perceiving of peripherally exposed objects to symbols other than digits. The results of these training procedures were found to be uniformly negative with regard to gain from pretests to posttests, with the exception of a certain degree of transfer from training with peripherally exposed digits to perception of Landolt rings, which were not used in training. It is concluded that perceptual training with extremely simple stimuli, such as those used in this investigation, is unlikely to result in a general improvement in form vision or in reading proficiency. These results contradict those found elsewhere in the literature. (Authors' abstract)

3964
Christensen, J. M.
THE IMPORTANCE OF CERTAIN DIAL DESIGN VARIABLES IN QUANTITATIVE INSTRUMENT READING. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-376, Oct. 1955. vii+61 p. (Project no. 7186). AD 97 492 PB 121119

Four dial designs, including moving pointer-clockwise, moving pointer-counterclockwise, moving scale-clockwise, and moving scale-counterclockwise, were presented tachistoscopically in random problem sets to subjects who were informed of the design to be presented prior to each exposure. Subjects were requested to fixate before exposure on an indicated point at which either the center of the dial or tip of the pointer was then presented. Results of the experiment indicate that: (1) individual differences in dial reading are clearly significant; (2) errors decrease approximately as a linear function of the logarithm of exposure time (from 75 to 1200 milliseconds); (3) practice produces improvement at all exposure speeds and changes the nature of the relationships among variables; (4) dials with moving pointers are superior to dials with moving scales; (5) dials with clockwise scales are superior to dials with counterclockwise scales; and (6) the number of errors and the interaction among design variables are affected by the relationship between dial type and fixation point prior to exposure.

3965
Christenson, C. M.
NOISE ON THE AIRLINE. — Noise Control, 1 (2): 53-54. March 1955. DLC (TA365.N6, v. 1)

Noise within the aircraft cabin originates from the increased speed and pressurization of flight or from loose equipment, poorly designed hardware, or improperly installed fixtures. Unnecessary cockpit noises, such as high-velocity airstream noises, are caused by poor exterior fuselage design, leaks around windows or windshields, internal equipment, or equipment installed in areas where natural resonance occurs and is carried by other panels into the cockpit area. Manufacturers of aircraft have over the years improved the interior noise levels.

3966
Christian, G. L.
EJECTION SEAT DESIGN: TWO APPROACHES. — Aviation Week, 62 (16): 96-99. April 18, 1955. DLC (TL501.A8, v. 62)

Two new ejection seats are described, developed for highspeed military aircraft. The seat developed by Republic Aviation Corp. is characterized by its standardization and adaptability to many aircraft. Chance Vought Aircraft has built a seat in which significant weight reduction is achieved without compromising pilot safety.

3967
Churchill, A. V., and D. G. Allan
EXPERIMENTAL DIAL DESIGN. — Defence Research Medical Labs. (Canada), Toronto, Ontario; issued by Defence Research Board. DRML Report no. 164-1, March 1955. v+8 p. (DRML Project no. 164, P. C. C. Project no. D77-94-20-27). AD 65 133 UNCLASSIFIED

An experiment was conducted to determine the relative speed and accuracy of dial reading under the following dial design conditions: black markings on a white background and white on black; numbers inside the scale and numbers outside; the pointer tip equidistant and at a different distance from major and minor scale marks; and standard scale and staircase scale. Sixteen different dial combinations were presented in random groups of eight. Analysis permits the following conclusions: (1)

black on white contrast dials are read in a significantly shorter time than white on black: (2) scale marks equidistant from the pointer tip show a statistically significant advantage in reading accuracy and a slight time advantage: (3) numbers outside the scale show a significantly lower reading error at critical pointer positions (pointer partially obscuring numerals inside the scale): and (4) errors of ten or less occur more frequently in the right half of the scale, and errors of greater than ten occur more frequently in the left half of the scale. (Authors' abstract, modified)

3968
Churchill, A. V.
MANIPULABILITY OF BRAILLE CONTROL KNOBS. — Canad. Jour. Psychol., 9 (2): 117-120. June 1955. DLC (BF1.C3, v. 9)

The comparative manipulability of braille control knobs (distinguishable by touch alone) of 8 different shapes was evaluated in terms of setting time and setting errors. Analysis of variance of the time data led to conclude that (1) statistically significant differences exist in time required to manipulate the control knobs of these shapes, and (2) two of the knob shapes are to be excluded whenever a manipulation speed difference of 1/2 second per setting is of practical importance.

3969
CIRCULAR SCREEN CUTS JET GROUND NOISE. — Amer. Aviation, 19 (3): 36. July 4, 1955. DLC (TL501.A675, v. 19)

Circular wire screens properly placed in the exhaust path of jet engines have been demonstrated to reduce engine noise by more than 7.5 decibels. A 1-mesh, 0.25-inch diameter wire screen offers the best compromise for non-critical resonance operation, structural integrity, and noise reduction.

3970
Civil Aeronautics Board
DID SENSORY ILLUSION FOOL PILOT? — Aviation Week, 63 (19): 90, 93-94, 97, 99, 103-104. Nov. 7, 1955. DLC (TL501.A8, v. 63)

On March 20, 1955, at 10:36 p.m. an American Airlines Convair crashed in an open field approximately 1 1/4 miles north-northwest of the Municipal Airport at Springfield, Missouri. Fatal or serious injuries were sustained by the crew and passengers. The Civil Aeronautics Board determined that the probably cause of this accident was a descent to the ground while approaching the airport caused by the crew's inattention to their flight instruments and a possible sensory illusion giving them an erroneous impression of the attitude of the aircraft.

3971
Civil Aeronautics Board
OFFICIAL CAB REPORT ON ITALIAN DC-6B CRASH AT IDLEWILD: PILOT FATIGUE CAUSED ERRATIC APPROACH. — Aviation Week, 63 (18): 57, 59, 61, 63, 67, 69, 71, 73, 75, 77, 79. Oct. 31, 1955. DLC (TL501.A8, v. 63)

On December 18, 1954, at 2:00 p.m. an Italian Airlines DC-6B aircraft crashed on its fourth approach into the pier supporting the left row of slope line approach lights to runway 4 at the New York International Airport (Idlewild). Six passengers were the only survivors. The Civil Aeronautics Board determined that the probable cause was an erratic approach which resulted in a descent to an altitude too low to avoid striking the pier. A contributing factor was found to be pilot fatigue engendered mostly by 2 1/2 hours of additional time devoted to making four approaches under considerable difficulties. The pilot's behavior during the last approach is particularly suggestive of fatigue.

3972
Clark, B.
TOPOGRAPHICAL ORIENTATION AND DISCRIMINATION. — Contact (Pensacola), 10 (1): 46-51. Jan. 1952. DNLM

This is a review of the studies conducted in one aspect of spatial orientation, namely the topographical orientation, i.e. the judgment of position with regard to various geographical points and areas. Among the senses vision plays a predominant role. The two primary factors involved in adequate orientation appear to be (1) the immediately perceived environment, and (2) the individual's mental map of the area, which is based on the capacity for spatial visualization rather than the individual's experience with the area. Topographical disorientation when it occurs seems to be related to the individual's condition of attention at the time of disorientation and to certain characteristics of the area.

3973
Clark, B.,
and A. Graybiel
DISORIENTATION: A CAUSE OF PILOT ERROR. — San Jose State Coll., San Jose, Calif.; and Naval School of Aviation Medicine, Pensacola, Fla. March 2, 1955. ix+82 p. (Research Report no. NM 001 110 100.39). AD 66 703 UNCLASSIFIED
Also Italian translation: Il disorientamento: una delle cause di errore del pilota. — Rivista di medicina aeronautica (Roma), 18 (2): 219-250; (3): 583-641. 1955. In Italian, with English, French, Spanish, and German summaries (p. 635-637). DLC (TL555.A1R5, v. 18)

A review is presented of the various factors which may lead to disorientation ("vertigo") of aircraft pilots and result in pilot error and accidents or near accidents. The principle perceptual mechanisms involved in spatial orientation are discussed: perception of the direction of gravity by the otolith organs and proprioceptors; visual perception, with illusory perception of motion (autokinesis); perception of rotation by the semicircular canals, including oculogyral illusion; and acoustic perception. Correct orientation is achieved by a proper coordination of these sensory mechanisms. In flight there is often a lack of conformity between the various cues to orientation. Errors may be based on gravitational cues (postural illusion, oculogravic illusion), on visual phenomena (autokinesis, illusory horizons, illusions of relative motion), on aftereffects of rotation (oculogyral illusion, coriolis effect), etc. "Fascination" (inability to respond to perceptual clues) also is a cause of pilot error. (72 references)

3974
Clark, D. M.
[EAR PROTECTOR] Protège-oreille. — French Patent 1,119,404. Feb. 17, 1955. 5 leaves. In French. DP

A helmet with built-in ear muffs to protect the ear from high intensity noises is described and illustrated. It is designed especially for jet pilots.

3975
Clark, J.
RECENT ADVANCES OF INSTRUMENTATION OF INTEREST IN AVIATION MEDICINE. I. TRANSDUCERS: PRESSURE TRANSFORMER TYPE. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 79-86. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

Two types of transformer pressure-sensing units designed on the basis of Timoshenko's theory of stress-strain relationships in circular plates may be used to record pressure changes in the vascular system, cerebrospinal fluid, ureter, and body cavities, and in the environment during explosive decompression. The differential (dual) pressure transformer consists essentially of two transformers placed on each side of a circular pressure-sensitive diaphragm separated by air gaps from the pole pieces. Controlled openings from the air chambers to the exterior allow the unit to be used as a differential pressure pickup, a gauge pressure indicator (relative to ambient), and an absolute pressure indicator (with one chamber sealed). The flush-diaphgram single transformer operates on the same basic principle. Differential transformers have been made to cover pressure ranges from 0-.09 p.s.i. to 0-50 p.s.i.

3976
Clark, R. T.,
D. Criscuolo, G. Guy, and B. Hoelscher
METABOLISM OF RATS CHRONICALLY AND ACUTELY EXPOSED TO VARIOUS ENVIRONMENTAL CONDITIONS [Abstract]. — Federation Proceedings, 14 (1^{I}): 28-29. March 1955. DLC (QH301.F37, v. 14)

Basal metabolism was measured at 5°, 28°, and 36° C. in rats chronically exposed for 3-5 months to heat (36° C.), cold (5° C.), altitude (18,000 ft.), or to heat at altitude. At 5° C. oxygen consumption was similar in all groups. The O_2 consumption of the heat at altitude group was lower at 28° C. than that of altitude and cold exposed animals, and was lower at 36° C. than that of cold and heat exposed groups. The dehydrogenase activity of liver homogenate was increased in all cases except in the heat exposed group. Myoglobin values in gastrocnemius tissue were decreased in heat exposed animals. Adrenal hypertrophy was observed in all but altitude exposed animals. Acute exposure to altitude in unadapted rats produced no change in rectal temperature or O_2 consumption during 48 hours.

3977
Clarke, H. H.,
C. T. Shay, and D. K. Mathews
STRENGTH DECREMENT INDEX: A NEW TEST OF MUSCLE FATIGUE. — Arch. Physical Med. and Rehabilitation, 36 (6): 376-378. June 1955. DLC (RM845.A8, v. 36)

The Strength Decrement Index, measuring the proportionate loss of strength in a given muscle group resulting from physical exertion, is proposed as a test of muscle fatigue. A description is presented of its application to pack-carrying and swimming studies.

3978
Clemedson, C. J.,
and C. O. Criborn
A DETONATION CHAMBER FOR PHYSIOLOGICAL BLAST RESEARCH. — Jour. Aviation Med., 26 (5): 373-381. Oct. 1955. DLC (RC1050.A36, v. 26)

A detonation chamber for physiological blast injury research is described. This chamber produces great pressure and impulse forces with only small charges of high explosive. The pressure and impulse values and the general shape and duration of the shock wave, produced under various conditions, are given, and the results discussed from a physiological point of view. (Authors' summary)

3979
Clerc, N.,
M. Turner, and E. L. Bérard
CHANGES IN HUMAN ELECTRODERMOGRAMS, SWEAT SECRETION AND SKIN TEMPERATURE, PRODUCED BY CHLORPROMAZINE (4560 RP) [Abstract]. — Acta physiologica latinoamericana (Buenos Aires), 5 (3): 163-164. 1955. In English. DLC (QP1.A25, v. 5)

Slow intravenous injection of chlorpromazine in humans was found to inhibit the electrodermal response and the stimulation of sweat secretion by administration of adrenaline and carbaminoilcholine. The contralateral nocireceptive stimulus response was unaffected. Skin temperature of the arms and cheeks was decreased, while that of the hands and legs was increased.

3980
Coates, T. A.
A RESTRICTED MEDICAL CERTIFICATION FOR CIVILIAN PILOTS. — Jour. Aviation Med., 26 (1): 70-72. Feb. 1955. DLC (RC1050.A36, v. 26)

The author requests that a new classification be created for the certification of physically imperfect individuals by the C.A.A.; he does not desire that the standards set for the airline pilot, the commercial pilot, or the private pilot be changed. However, he does express the belief that piloting a light aircraft is so much simpler and safer than driving an automobile, that the handicapped individual who is permitted to drive on the public roads would be less of a hazard, to both himself and his fellows, if he were flying.

3981
Cochran, L. B.,
P. W. Gard, and M. E. Norsworthy
G x TIME PATTERNS IN THE NAVAL AIR TRAINING COMMAND PHASES IV AND V: AEROBATIC AND GUNNERY MANEUVERS AS FLOWN IN ADVANCED TRAINING UNITS 300 AND 301. — Na-

val School of Aviation Medicine, Pensacola, Fla. Feb. 21, 1955, vi+38 p. (Research Report no. NM 001 100 103.03). AD 66 701 UNCLASSIFIED

Flight students in the Naval Air Training Program have been exposed to sufficient positive radial accelerations during various flight maneuvers to frequently produce symptoms of greying, blackout, and unconsciousness. This study reports the findings of g x time flight patterns as flown by personnel in Advanced Training Units 300 and 301 in the AD-1 and F6F-5 aircraft. It was found that the magnitudes and durations of g stresses imposed were of sufficient degree to frequently produce undesirable physiologic impairment. These findings confirm the importance of repeated indoctrination of all flight personnel on the protection provided by anti-blackout equipment in an endeavor to improve both efficiency of flying and flight safety. (Authors' abstract)

3982
Cohen, G.
[AERONAUTICAL NOISE] Les bruits aéronautiques. — Nature (Paris), 83 (3242): 222-225. June 1955. In French. DLC (Q2.N2, v. 83)

A discussion is presented of (1) the physiological effects of sonic, ultrasonic, and infrasonic noise, including acceleration of the respiratory and cardiac rhythms, digestive disturbances, cortical lesions, and blood changes; (2) the sources of aircraft noise, including the propeller, the motor, and air turbulence; (3) conditions of personnel exposure; and (4) measures to reduce aircraft noise and its damaging effects on flying personnel, ground personnel, passengers, and residents of airport areas.

3983
Cohen, J. D.,
and R. K. McKelvey
THE BEHAVIOR OF INDIVIDUALS AND PERSONNEL SYSTEMS IN THE SURVEILLANCE FUNCTIONS OF THE AIR DEFENSE DIRECTION CENTER. III. DISTRIBUTION OF RESPONSES WITH RESPECT TO JOB FUNCTIONS. — Crew Research Lab., Randolph Air Force Base, Tex. Research Report no. AFPTRC TN-55-11, June 1955. vi-15 p. (Project no. 7712, Task no. 77207). AD 72 410 PB 118606

This report describes the performance of aircraft control and warning operators working under standard system operations. Samples of job performance data are summarized in terms of the distributions of types of responses observed at three air surveillance positions: scope operator, plotter, and teller/recorder. Analysis of the data reveals the characteristic ways aircraft control and warning operators perform, thus providing a tentative basis for anticipating performance under other, more critical, conditions. The influence of a number of supervisory and operating practices on the effectiveness of individual performance is also discussed. (Authors' summary)

3984
Colin, J.,
and R. Brice
[PHYSIOLOGICAL BASES OF THE PROTECTION OF THE AVIATOR AT HIGH ALTITUDES: THE FRENCH ALTITUDE SUIT] Bases physiologiques de la protection de l'aviateur aux grandes altitudes: le vêtement d'altitude français. — Médecine aéronautique (Paris), 10 (4): 513-520. 1955. In French. DLC (TL555.M394, v. 10)

A description of the high-altitude suit as developed in France is presented, and related problems of pressure breathing, mobility, and ejection are discussed.

3985
Collins, K. J.,
K. Hellmann, R. M. Jones, and J. B. Lunnon
ALDOSTERONE ACTIVITY IN THE URINE OF MEN EXPOSED TO HOT ENVIRONMENTS [Abstract]. — Jour. Endocrinol. (London), 13: viii. 1955. DNLM

An increase in urinary aldosterone content was found in subjects exposed nude and in a sitting position for periods of two hours on nine successive days at a mean temperature of 36.5° C. dry bulb, and 35.5° C. wet bulb. From a consideration of the average sweat loss of the heat-exposed subjects and their salt intake it was unlikely that the increased aldosterone excretion could be accounted for by a negative salt balance. It seems therefore that it reflects an increased aldosterone secretion as a result of exposure to heat and humidity. (From the authors' abstract)

3986
Collins, K. J.,
and K. Hellman
THE EFFECT OF HEAT EXPOSURE ON THYROID AND SALIVARY GLAND ACTIVITY IN THE MOUSE. — Jour. Physiol. (London), 128 (3): 49P. June 28, 1955. DLC (QP1.J75, v. 128)

Litter-mates from a group of mice reared in a hot (91° F. dry bulb, 85° F. wet bulb) environment were injected at the age of 8 or 21 weeks with I^{131} and killed 2 3/4 hours later. The uptake of I^{131} into the thyroid gland was found to be reduced in hot-reared animals as compared with moderate-reared controls, while the uptake into the salivary glands was increased.

3987
Collins, P. E.
BRING 'EM BACK ALIVE. — Air Training, 4 (7): 22-24. Feb. 1955. DLC (UG633.A1A52, v. 4)

A typical mission of the Air Training Command accident team is described. Composed of professional fliers, the team assists local safety officers in the development of effective safety programs through guidance based on inspection of local operational procedures.

3988
Columbia University Engineering Center
SIMULATION STUDY. — Electronics Research Labs., Columbia University Engineering Center, New York (Contract AF 30(635)-2815). Progress Report no. P-1/128, 1955. iii+39 p. (Project no. 4506, Task no. IV, 45360). AD 72 854. PB 118824

A multiple-target radar simulator of high realism which will produce a small number of precisely reproducible manually- or program-controlled tracks is described. Some components of the single-target simulator are to be improved, and an accurate method of track generation is to be constructed. A 2.5 mc. dynamic binary counter which can be sampled between input count pulses has been designed, and preliminary implementations have verified its feasibility.

3989
Comroe, J. H.
METHODS FOR ASSESSING PULMONARY FUNCTION: FINAL (SUMMARY) REPORT. — Pennsylvania Univ. Graduate School of Medicine, Philadelphia (Contract DA 18-108-CML-2212); issued by Chemical Corps Medical Labs., Army Chemical Center, Md. Medical Laboratories Contract Report no. 65, Sept. 1955. 11 p. AD 79 990
UNCLASSIFIED

New methods are described for studying pulmonary function in animals and man. Studies in man are concerned primarily with the: (1) single breath method for measuring lung volume; (2) plethysmographic method for measuring thoracic gas volume; (3) volume of trapped gas; (4) alveolar ventilation and dead space; (5) oxygen dissociation curves at high carbon dioxide pressures; (6) compliance of the human lung or lung-thorax; (7) measurement of airway resistance; (8) quantitative measurement of nasal airway resistance; (9) measurement of tissue resistance; (10) inertia of the lung-thoracic system; (11) maximal breathing capacity; and (12) maximal expiratory and inspiratory flow rates. Noted are studies on the effects of chemical agents on the lung of man and animals, and on the physiological mechanisms regulating respiration.

3990
THE CONCEPT OF MOTION SENSITIVITY. — Internat. Record Med., 168 (6): 371-376. June 1955.
DLC (R11. M745, v. 168)

A brief discussion is presented on motion sickness including the following topics: the prodromal and other symptoms; the labyrinthine, nonlabyrinthine (movements of abdominal viscera, small visual stimuli), and psychological etiological factors; susceptibility, and prevention and therapy.

3991
Conrad, R.
ADAPTATION TO TIME IN A SENSORIMOTOR SKILL. — Jour. Exper. Psychol., 49 (2): 115-121. Feb. 1955. DLC (BF1. J6, v. 49)

Same as the item no. 1258, vol. 2.

3992
Coonan, T. J.,
and E. T. Klemmer
INTERPOLATION AND REFERENCE MARKS IN READING A LINEAR SCALE AT BRIEF EXPOSURES. — Air Force Cambridge Research Center. Operational Applications Lab., Bolling Air Force Base, Washington, D. C. Report no. AFCRC-TR-55-3, March 1955. iii+9 p. AD 68 165 PB 118226

A series of experiments was conducted to investigate the relation between scale reading accuracy and number of reference marks under conditions of brief exposure. Observers were asked to locate a point on a 32-unit horizontal scale with the aid of 1 to 31 internal reference marks. Stimuli were presented tachistoscopically for exposure durations of 0.02 to 0.64 seconds. Addition of more than one reference mark did not increase reading accuracy for exposures of 0.02 seconds duration. Accuracy was increased for exposure times of 0.04 and 0.16 seconds by addition of quarter-point marks, but was decreased by addition of eight-point or finer reference marks. At 0.64 seconds accuracy was increased by addition of scale marks until a condition of negligible error was reached when more than 8 reference marks were provided. It is concluded that for any given exposure duration there exists an optimum number of reference marks for maximum scale reading accuracy, above which errors of mark identification are introduced. A larger number of marks may be profitably used on any scale if errors are consistently less than the smallest subdivision of the scale. (Quoted in part)

3993
Coone, H. W.,
C. B. Marshall, V. M. Downey, A. D. Johnston, M. J. Schwarz, and D. A. Rosenbaum
DECOMPRESSION SICKNESS. — U. S. Armed Forces Med. Jour., 6 (12): 1787-1789; discussion, p. 1789-1799. Dec. 1955.
DLC (RC970. U7, v. 6)

A report is presented of a case of fatal decompression sickness in an obese (250 pounds) passenger of a T-33 jet plane. The patient ascended to 26,000 feet cabin altitude in 20 minutes and to 29,000 feet in a 3 1/2 minute period. Exposure at this altitude for 2 minutes coincided with incoherence, numbness, visual disturbance and loss of consciousness. Return to 10,000 feet was accomplished within 5 minutes with landing within 20 minutes after onset of symptoms. A clinico-pathological discussion of this case showed: (1) bends to be the cause of death; (2) cerebral and pulmonary pathology, and (3) visible vasomotor phenomena possibly resulting from vasovagal reflexes.

3994
Coons, D. E.
FLIGHT TEST RESULTS OF CARBON MONOXIDE IN USAF JET AIRCRAFT. — Wright Air Development Center. Directorate of Flight and All-Weather Testing, Wright-Patterson Air Force Base, Ohio. Technical Note WADC-55-213, July 1955. 11 p. (Project no. 6075). AD 69 345 UNCLASSIFIED

Tests to determine the amount of carbon monoxide present in the cockpit during various flight and ground conditions were conducted on the T-33, F-89D F-84F, F-84G, F-94C, B-45, B-47 and B-57A. A portable carbon monoxide detector (Type B-1) was used to analyze samples of cockpit air obtained near the oxygen regulator. Within the limits of sensitivity of the detector, no traces of carbon monoxide were found in the above aircraft during any of the flight conditions checked, however during a ground check of a B-47 with cockpit open, some carbon monoxide was detected. Through a subsequent ground check it was ascertained that the carbon monoxide was entering through the open canopy, not through the cabin air system. In no other test condition was the presence of carbon monoxide detected. (Author's summary)

3995
Corbet, A. A. G.,
and D. G. M. Nelson
LESSONS FOR CIVILIANS DERIVED FROM THE AEROMEDICAL EVACUATION OF MILITARY PATIENTS. — Canad. Med. Assoc. Jour. (Montreal), 72 (2): 111-116. Jan. 15, 1955. DNLM

An outline is given of the history and advantages of aeromedical evacuation. The conditions of temperature variations, anoxia, decompression and gravity encountered during flight are considered in the selection of patients for aeromedical evacuation. Cases requiring special consideration during air travel include patients with mental disorders, cardiac or respiratory disorders, maxillofacial injury, diabetes mellitus, surgical cases, and aged, pregnant, or infant patients. It is suggested that the civilian field adopt the following military classification of patients for aeromedical evacuation: (1) litter patients other than neuropsychiatric; (3) walking patients other than psychiatric who require minor attention en route, and (4) troop class-walking patients requiring no medical attention. An expanded use of helicopters is recommended along with the institution of a standard control system for all air movement of poliomyelitis cases in Canada.

3996
Cordier, D.,
and J. F. Worbe
[STUDY ON THE INTESTINAL ABSORPTION OF HEXOSES AND PENTOSES IN THE FROG (Rana esculenta). II. INFLUENCE OF OXYGEN TENSION ON THE SPEED OF ABSORPTION] Etude sur l' absorption intestinale des hexoses et de pentoses chez la Grenouille (Rana esculenta). II: Influence de la tension d' oxygène sur la vitesse de l' absorption. — Comptes rendus de la Société de biologie (Paris), 149 (1-2): 110-112. Jan. 1955. In French.
DLC (QP1.S7, v. 149)

The rate of intestinal absorption of glucose, galactose, fructose, and xylose during hypoxia was determined by measuring the amounts of the administered sugars remaining in the intestines of frogs after exposure for eight hours to an atmosphere of 3-3.9% oxygen. Hypoxia was found to decrease significantly the absorption of glucose and galactose, while the rate of absorption of fructose and xylose was unaffected.

3997
Cormack, R. S.,
D. J. C. Cunningham, and J. B. L. Gee
SOME RESPIRATORY STUDIES ON THE EFFECT OF WANT OF OXYGEN IN MAN [Abstract]. — Jour. Physiol. (London), 129 (3): 29P-30P. Sept. 28, 1955.
DLC (QP1.J75, v. 129)

A determination of the respiratory response to anoxia alone, without complication by acapnia, was made by continuously adding CO_2 to an anoxic respiratory gas mixture in an amount necessary to compensate for alveolar pCO_2 deficiency. Data obtained from a comparison of ventilation rates with alveolar pCO2 were found to be inconsistent with Gray' s "oxygen ventilation equation" but consistent with Fitzgerald' s data on individuals acclimatized to high altitudes. When the alveolar pCO_2 was kept constant at 5 or 10 mm. Hg above resting values, the ventilation increase resulting from anoxia alone was increased. An interaction between CO_2 and anoxic stimuli was thus indicated.

3998
Cotzin, M.,
C. J. Hill, and G. R. Wendt
STUDIES OF MOTION SICKNESS. XIV. SUBJECTIVE REPORTS OF THE APPARENT PATH OF MOTION ON A VERTICAL ACCELERATOR. — Jour. Psychol., 39 (2): 417-412. April 1955.
DLC (BF1.J67, v. 39)

Subjects exposed to wave motion on a vertical accelerator were asked to describe the apparent path of motion. Out of 267 subjects, 93 subjects reported only one kind of motion, 122 subjects reported two kinds, 44 subjects three kinds, 6 subjects four, and 2 subjects five kinds. Most of the reported motions other than the true vertical were ellipses or modified ellipses. (Authors' summary)

3999
Coughlin, W. J.
AFTERMATH OF A SUPERSONIC BAILOUT. — Aviation Week, 63 (20): 13-17. Nov. 14, 1955.
DLC (TL501.A8, v. 63)

The experiences of the first pilot to survive a supersonic bailout at low altitude are reported after an interview of the survivor. Test pilot George F. Smith bailed out at 6,500 ft. altitude from a Super Sabre aircraft diving at a speed of 777 m. p. h. The deceleration forces acting on his body at ejection were estimated at 40 g. Full recovery from injuries inflicted by the g forces and the dense air at that altitude took approximately seven months. Permanent injuries include damage to the liver and impaired dark adaptation. In spite of weeks of blindness, sight was fully recovered. Smith recently passed the Civil Aeronautics Administration's physical examination and is licened to fly again.

4000
Coules, J.
EFFECT OF PHOTOMETRIC BRIGHTNESS ON JUDGMENTS OF DISTANCE. — Jour. Exper. Psychol., 50 (1): 19-25. July 1955.
DLC (BF1.J6, v. 50)

Relative distance judgments were obtained under monocular and binocular conditions with two subjects. The distance of the variable stimulus and the brightness ratio of the variable to the standard stimulus were varied. In a second experiment the subjects made distance judgments under binocular conditions using the up-down method, whereby the brightness level was varied in addition to the previous variables. Psychophysical functions indicated that brightness is a factor in judgments of distance under binocular and monocular conditions. Stimulus-stimulus functions for binocular conditions showed that a brighter object farther away is equivalent to a dimmer object that is nearer. This effect of brightness operated at all three levels of brightness. Observer bias was accounted for by differences in ocular dominance.

4001
Cournand, A.
THE MYSTERIOUS INFLUENCE OF UNILATERAL PULMONARY HYPOXIA UPON THE CIRCULATION IN MAN. — Acta cardiologica (Bruxelles), 10 (5): 429-441. 1955 DNLM

Using a method combining bronchospirometry, cardiac catheterization and arterial cannulation, simultaneous determinations were made of total pulmonary blood flow, separate blood flow through each lung, and pulmonary arterial pressures in six subjects breathing ah oxygen-poor mixture. Under conditions of moderately unilateral hypoxia no evi-

dence was found of an increased vascular resistance in the ipsilateral lung. Arterial oxygen saturation decreased slightly during the hypoxic periods. Total blood flow was approximately 33% above basal metabolic levels, and blood pressure in the pulmonary artery remained unaltered. While subjects breathed with one lung a mixture of 8% and 6% oxygen in nitrogen, a notable increase was observed in total pulmonary blood flow associated with a drop of arterial oxygen saturation down to 85%. No rise was seen in pulmonary artery pressure. Using the same procedures, bilateral hypoxia was induced by administering to both lungs through separate airways of the bronchospirometer the same low oxygen mixture. A drop was observed in arterial blood oxygen saturation down to 64%. Mean pulmonary artery pressure rose significantly by 5 mm. Hg.

4002
Covino, B. G.,
and A. H. Hegnauer
ELECTROLYTES AND PH CHANGES IN RELATION TO HYPOTHERMIC VENTRICULAR FIBRILLATION. — Circulation Research, 3 (6): 575-580. Nov. 1955. DLC (RC681.A1A57137, v. 3)

Coronary arteriovenous electrolyte differences were studied in normo- and hypercapneic dogs at normal temperature and 24° C. The ions measured were sodium, potassium, calcium, magnesium, chloride, and hydrogen. Coronary arteriovenous electrolyte differences did not change during cooling in 16 dogs which did not suffer ventricular fibrillation. Ten hypercapneic dogs exhibited characteristic Ca, K, and H ion changes at 24° C. before succumbing to ventricular fibrillation. The data suggest that ventricular fibrillation at low body temperatures is related to a gain of Ca and a loss of K and H ions by the hypothermic hypercapneic myocardium. (Authors' abstract)

4003
Covino, B. G.,
and L. Williams
EXCITABILITY CYCLE OF THE VENTRICLE IN HYPOTHERMIA. — Amer. Jour. Physiol., 181 (2): 362-366. May 1955.

Variations in the electrical excitability of the ventricle during the cardiac cycle were studied in pentobarbitalized dogs at body temperatures of 35°, 30°, and 25° C. Hypothermia was observed to cause a decrease in the mean excitability threshold at the major dip in the electrocardiographic cycle, a lesser decrease during diastole, from the peak of the T-wave to the end of the cycle, and in some cases a decrease to 0.99 milliamperes at the minor dip. A decline in threshold below 2.73 ma. at the minor dip was associated with the appearance of an injury potential which was seen as an upward deflection from the termination of the QRS complex. Both phenomena are attributed to low blood pH. A correlation was demonstrated between the occurrence of the injury current and eventual death from ventricular fibrillation.

4004
Covino, B. G.,
and D. A. Charleson
VENTRICULAR DIASTOLIC THRESHOLD IN HYPOTHERMIA. — Amer. Jour. Physiol., 181 (2): 357-361. May 1955. DLC (QP1.A5, v. 181)

Ventricular diastolic threshold amperage was measured in dogs at normal and low body temperatures under pentobarbital or thiopental anesthesia. Under normothermic conditions a variable threshold was observed which after 1-1.5 hours rose to a value greater than 2.73 milliamperes (ma.). Moderate hypothermia produced a general decrease in threshold and an increase in variability, with thresholds ranging from 0.5 to more than 2.73 ma. Below 28° or 24° C. (under pentobarbital and thiopental, respectively) animals were sharply separable in two groups, characterized either by maintenance of a relatively high ventricular threshold or by a progressive decline in threshold. Dogs of the high threshold group invariably cooled to asystole at 15-18° C., while most of the low threshold group succumbed to ventricular fibrillation between 26° and 19° C.

4005
Covino, B. G.,
and A. H. Hegnauer
VENTRICULAR EXCITABILITY DURING HYPOTHERMIA AND REWARMING IN THE DOG. — Proc. Soc. Exper. Biol. and Med., 89 (4): 659-662. Aug.-Sept. 1955. DLC (QP1.S8, v. 89)

All portions of the excitability cycle of the dog's ventricle were observed to suffer a progressive fall in threshold as body temperature was lowered to 25° C. by immersion under conditions of spontaneous respiration. The decrease in threshold was especially marked in early systole at a point designated as the minor dip. The general increase in myocardial irritability was reversible, the normal excitability recovery curve being reestablished by rewarming to normal body temperature. No change in ventricular excitability except at the major dip occurred during hypothermia when the pH of the blood was maintained at a normal level by controlled ventilation during the cooling process. Both the total "refractory" period and the ventricular conduction time were prolonged during cooling and returned to normal during rewarming. (Authors' summary, modified)

4006
Craig, E. A.
PERCEPTUAL-MOTOR TASK ACHIEVEMENT UNDER TWO CONDITIONS OF STIMULUS DISPLAY. — Jour. Gen. Psychol., 53 (2): 281-285. Oct. 1955. DLC (BF1.J64, v. 53)

Achievement rates for a relatively simple perceptual-motor response to displays of 10, 20, 30, 40, and 50 targets were measured under two conditions. Under Condition I, all targets were presented simultaneously and remained for the duration of the 10-second trial. The subject was thus allowed an opportunity to pace his own reactions to the targets for maximum score. Under Condition II, targets were presented in a temporal sequence which forced the subject to react to each target within its 2.5-second exposure time or miss the score. Higher mean scores were obtained under Condition II than under Condition I in all cases except for the 10-target pattern where no difference was measured. A non-parametric test of paired mean scores for eight subjects responding to the five target patterns under each condition indicated that the overall performance difference was significant at the .01 level of confidence. Variability of the attained scores followed different trends under the two conditions. (Author's summary and conclusions)

4007
Crampton, G. H.
STUDIES OF MOTION SICKNESS. XVII. PHYSIO-

LOGICAL CHANGES ACCOMPANYING SICKNESS IN MAN. — Jour. Applied Physiol., 7 (5): 501-507. March 1955. DLC (QP1.J72, v. 7)

Twenty-two men were stimulated in an elevator-like apparatus for one hour or until they vomited, whichever occurred first. Simultaneous measures of a number of physiological variables were obtained. The vomiting group could be distinguished from the non-sick group by the following differences: a) greater increase in pulse rate, b) greater vasoconstriction, c) greater increment in ventilation, d) more abrupt decrement in gastric tone, e) more sweating, and f) more facial pallor. With the exception of pallor, these differences were evident only in the comparison of group means because of the great between- and within-subject variability. The only common sequence of events, true of most individuals, was the onset of pallor, then the report of nausea, and finally vomiting. (Author's abstract, modified)

4008
Craven, C. W.,
and Clayton S. Smith
STEROID EXCRETION IN AIRMEN UNDER STRESS. — Jour. Aviation Med., 26 (3): 200-205, 213. June 1955. DLC (TL555.A1A4, v. 26)

Phenolic-steroid and formaldehydogenic-steroid excretion levels were measured for normal airmen during various periods of activity. Urine samples were collected from each subject for day, night, and flight periods. The samples were subjected to an enzyme hydrolysis procedure and then dehydrated and frozen. When the quantitative analysis was performed, the frozen urine residues were dissolved in water and extracted with ether to remove the steroid fraction. The phenolic steroids were separated from the formaldehydogenic steroids by washing the ether extract with sodium hydroxide solution. The pH of the basic solution was adjusted to 9.0 and the phenolic steroids were extracted again with ether. After purification, the phenolic fraction and the formaldehydogenic fraction of the steroids were measured by the flourometric method and the periodic acid oxidation method, respectively. The excretion level of phenolic steroids showed a significant increase during flight periods; the level of the formaldehydogenic steroids was not altered by the periods of flight. (Authors' summary, modified)

4009
Creelman, J. A.
EVALUATION OF A PROPOSED INSTRUMENT SEQUENCE. III. BASIC INSTRUMENT AND NIGHT PRIMARY PROFICIENCY. — Naval School of Aviation Medicine, Pensacola, Fla. Special Report no. 55-18, Dec. 15, 1955. ii+5+3 p. AD 85 665 UNCLASSIFIED

Proficiency in the night primary and instrument stages of flight training was compared in an experimental integrated syllabus instrument training group and in students trained under current procedures. Night primary grades and number of downs were found to be significantly lower in the experimental group. Comments by the instructors of the group in response to a questionnaire indicated that the integrated students were "worse" than those instructed in the normal manner, and that the integrated syllabus would be most effective if the first eight instrument flights were given after, rather than during, the acrobatic stage of training.

4010
Creelman, J. A.
EVALUATION OF APPROACH TRAINING PROCEDURES. — Naval School of Aviation Medicine, Pensacola, Fla. Oct. 17, 1955. iii+[20] p. (Project no. NM 001 109 107, Report no. 2). AD 89 997 UNCLASSIFIED

The training effectiveness of a contact approach trainer was evaluated under routine training conditions within the framework of navy primary flight training. The results indicated that the group of subjects receiving the training received significantly higher instructor ratings on approaches, fewer practice landings during pre-solo stage, and fewer unsatisfactory check flights than did the control group. (Author's abstract)

4011
Creutzfeldt, O.,
A. Vaz-Ferreira, and A. Kasamatsu
THE BEHAVIOR OF SINGLE CORTICAL NEURONES UNDER CONDITIONS OF ANOXIA [Abstract]. — Electroencephalography and Clinical Neurophysiol. (Montreal), 7 (4): 662. Nov. 1955. DNLM

The action potentials of 40 single neurons of the sensory-motor cortex were recorded with micropipettes and their behavior was studied when the animal was given pure nitrogen through the trachea for 1 minute. The survival times of the neurons were 20-50 seconds (average, 33 sec.), that of the electroencephalogram about 36 sec. The recovery time of the cortical neurons until the reappearance of the first discharges after resumption of respiration with fresh air ranged between 10 and 120 sec., normalization of the discharges usually occurring after 2-3 min. (Abstract, modified)

4012
Criscuolo, D.,
R. T. Clark, and R. B. Mefferd
EFFECTS OF LOW AND HIGH IRON SUPPLEMENTATION ON HYPOXIC RATS. — Amer. Jour. Physiol., 180 (1): 215-218. Jan. 1955. DLC (QP1.A5, v. 180)

Rats fed a low iron or high iron dietary supplement survived exposure to a simulated altitude of 20,000 ft. for a period of six weeks equally well. A hemoglobin increase seen in the high-iron animals was thus apparently not indispensable for survival. Hematocrits and red cell counts were increased in the low iron group, indicating that the hemopoietic response in these animals was unaffected. The myoglobin content of various tissues, and oxygen utilization, as reflected by succinic dehydrogenase activity, increased in both groups.

4013
Criscuolo, D.,
and R. T. Clark
THE MYOGLOBIN CONTENT OF VARIOUS RAT TISSUES AS AFFECTED BY ALTITUDE AND EXERCISE. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-84, Dec. 1955. 11 p. AD 90 762 UNCLASSIFIED

Rats chronically exposed to 20,000 feet simulated altitude showed an increase in myoglobin content of the heart, diaphragm, and gastrocnemius muscles. Exercise did not materially affect this increase. The increase was noted early in the period of acclimatization, about the fourth and fifth weeks; then the values returned to normal at the end of the tenth week. Rats reared at altitude showed about the same myoglobin content as the chronically exposed rats at the tenth week. (Authors' summary)

4014
Crumley, L. M.,
and R. P. Brissenden
GLOWMETER INSTRUMENT PRESENTATION: A COMPARISON OF THE EFFECTS OF TWO METHODS OF DIAL ILLUMINATION ON READABILITY. — Naval Air Material Center. Aeronautical Medical Equipment Lab., Philadelphia, Pa. Report no. TED NAM AE-7047.12, Aug 12, 1955. [29] p. AD 76 490
UNCLASSIFIED

The readability of a rear-illuminated dial presentation, which simulated projected-image display, was compared with 2 forms of standard, front illuminated dial presentation. The stimulus variables selected were type of dial presentation (round, front-illuminated; open-window, front illumination) and the level of ambient illumination (125, 235, and 380 ft. candles). Two other independent variables included were kind of dial face (clock, multirevolution, and compass or heading indicator) and subjects (36 enlisted men and laboratory personnel). Experimental evidence did not support any claim of better readability for projection type displays. Improved methodology of experimentation with more adequate sampling of illumination would yield more definitive data concerning projected display in aircraft. (AD abstract)

4015
Cuba Caparó, A.,
M. Capaira, and E. de la Vega
[CHRONIC MOUNTAIN SICKNESS IN COWS (BRISKET DISEASE): HEMATOLOGICAL AND ANATOMOPATHOLOGICAL STUDY] Mal de montaña crónico en vacunos (Brisket disease): estudio hematológico y anatomo-patológico. — Anales de la Facultad de medicina, Universidad nacional mayor San Marcos de Lima (Peru), 38 (2): 222-231. 1955. In Spanish, with English summary (p. 230-231). DNLM

A study was made of chronic mountain sickness in three highly bred Brown Swiss calves born at 4,000 meters above sea level and in one Holstein cow previously living at 143 meters of altitude in (Lima, Peru) and moved to 3,500 meters above sea level (Huancayo, Peru). Polycythemia was observed (increase of 620,000 erythrocytes per $mm.^2$) along with hypertrophy, hyperplasia, necrosis and hemorrhage of the adrenal glands, atrophy of lympoid tissue, and myocardial degeneration. (Authors' summary, modified)

4016
Currie, J. C. M.,
and E. Ullman
HYPERNOEA AND RENAL WATER EXCRETION [Abstract]. — Jour. Physiol. (London), 129 (3): 73P-74P. Sept. 28, 1955. DLC (QP1.J75, v. 129)

Voluntary hyperpnea with alveolar pCO_2 maintained at a constant level was found in some cases to increase water excretion without increasing electrolyte excretion. The increase, the occurrence of which was thought to depend on individual susceptibility and adequate pre-hydration, was less than that produced by hypoxia or hypercapnia. It is concluded that the polyuria produced by hypocapnia, hypercapnia, and anoxia is due in part to hyperpnea but is additionally stimulated by changes in blood gas content.

4017
Dambly
[DENTAL PAIN AT ALTITUDE IN THE AIRMAN] Douleurs dentaires en altitude chez l'aviateur. — Force aérienne, Service de santé, Bulletin technique d'information [Bruxelles], 2 (1): 35-37. Jan. 1955. In French. DNLM

Dental pains encountered at high altitude are categorized by degree and by cause (N_2 bubbles or disease). Treatment appropriate to the various changes of dental disease is recommended.

4018
Damsté, P. H.
[BETWEEN PILOT AND AIRCRAFT] Tussen piloot en vliegtuig. — Nederlands militair geneeskundig tijdschrift (Gravenhage), 8 (9): 257-264. 1955. In Dutch. DLC (RC971.N4, v. 8)

Application of the principles of cybernetics and human physiology to man-machine relationships is reviewed.

4019
D'Angelo, S. A.,
C. E. Stevens, K. E. Paschkis, and A. Cantarow
THE EFFECT OF HYDROCORTISONE AND ASCORBIC ACID ON ADRENAL FUNCTION IN THE COLD-EXPOSED GUINEA PIG [Abstract]. — Jour. Clin. Endocrinol. and Metabolism, 15 (7): 884. July 1955. DLC (RC648.E45, v. 15)

Adult female guinea pigs exposed to cold (7° C.) for 6-7 weeks showed significant increases in adrenal size and urinary corticoid excretion while maintaining normal ascorbic acid concentrations in the adrenals. The administration of hydrocortisone acetate completely inhibited adrenal hypertrophy and significantly reduced adrenal ascorbic acid concentration in the cold-exposed animal. High-level dosage with sodium ascorbate increased ascorbic acid concentration in the adrenal but failed to prevent the hypertrophy to cold. The results are believed to signify that augmented adrenal function in cold stress can be reduced by high-level dosage with adreno-cortical steroids but not with ascorbic acid. The effect is presumed to be mediated by corresponding reduction in the activity of the ACTH mechanism in the adenohypophysis. (Quoted in part)

4020
Danneskiold, R. D.
OBJECTIVE SCORING PROCEDURE FOR OPERATIONAL FLIGHT TRAINER PERFORMANCE. — The Psychological Corp., New York, N.Y. (Contract N9onr 99902); issued by Office of Naval Research. Special Devices Center, L.I., New York. Technical Report no. SPECDEVCEN 999-2-4, Feb. 15, 1955. 97 p. (SPECDEVCEN Project 20-A-13). AD 110 925
UNCLASSIFIED

The general approach to the problem of evaluating student performance in operational flight trainers included several phases. First, the basic rationale of flight grading was established by reviewing historical data on measurement of general flight performance. Next, specific methods of grading certain areas of flight performance was studied. Similarties and differences between inflight and synthetic trainer grading principles were then determined, and areas were established where the need for improved grading appeared most critical. The final phases were concerned with the actual development of particular grading techniques and the analysis and improvement thereof. It is emphasized that the development of grading procedures in operational flight trainers must be geared to meet specific needs because grading procedures suitable for some situations may be inadequate for others.

4021
Davenport, E. W.
AN INVESTIGATION OF FATIGUE IN ASW HELICOPTER CREWS. — Navy Electronics Lab., San Diego, Calif. Research Report no. 610, June 6, 1955. 15 p. AD 76 250 UNCLASSIFIED

A preliminary opinion survey of ASW helicopter squadron personnel indicated that crew fatigue was considered an operating problem, possibly performance-limiting under prolonged search conditions. An intensive 5-day experiment was conducted with 4 experienced crews. The schedule performed by the pilots and sonar operators was considered rigorous and fatiguing by the subjects and by other observers. No conclusive evidence was obtained from inflight measures to indicate that actual performance was adversely affected by fatigue. The postflight or interpolative tests did not reveal performance decrements commensurate with reported fatigue. No evidence was obtained to indicate that auditory fatigue from exposure to helicopter noise reduces the sonar operator's ability to detect a faint signal in a masking noise background. Significant temporary hearing loss following flights was observed for sonar operators but not for pilots. The principal factors affecting fatigue in the helicopter crew are psychological factors such as monotony, boredom, anxiety, and frustration. (AD abstract)

4022
Davidson, L. E.
HEARING IS WORTH SAVING. — National Safety News, 71 (2): 26-27, 88-93. Feb. 1955. DNLM

Pre-employment hearing tests within the aircraft industry provide an accurate record of the employee's auditory history and findings at the time of initial hire, and serve as a means for the selective placement of employees in positions compatible with their hearing acuity and ear stability. Re-examinations are also performed periodically to determine any hearing loss. Several types of ear protectors are used: wax-impregnated cotton plugs, synthetic-rubber inserts and ear muffs. Employees subjected to noise levels in excess of 130 decibels are required to wear both insert type plugs and ear muffs.

4023
Davies, G. K.
REPORTS DEALING WITH NUTRITION IN RELATION TO SURVIVAL FEEDING. — Defence Research Board (Canada). Defence Scientific Information Service, Ottawa. Bibliographic Series, DRB 55/5827, June 1955. i+31 p. DNLM

A title bibliography is presented of reports issued by government agencies of Canada, the United Kingdom, and the United States concerning survival rations, the physiological effects of restricted diets, general nutritional requirements, and the physiology of man in the desert.

4024
Davies, N. E.
REPORT OF HYDROCARBON INTOXICATION. — Continental Air Command Medical Training Bulletin, 3 (1): 11-16. March 1955. DNLM

A report is presented of the occurrence of hydrocarbon poisoning through vaporization of leaking fuel in the cockpit of a T-33 aircraft. Symptoms of poisoning experienced by the pilot during flight included grogginess and confusion. Physical examination immediately after the flight revealed no positive symptoms other than a slight staggering gait, slight slur in speech, positive Rhomberg, generalized weakness, and possible decreased sensation to painful stimuli over the dorsum of the right forearm. It is recommended that (1) an appropriate laboratory test for hydrocarbons be performed routinely on all pilots involved in similar unexplained incidents; (2) a simple kit be designed for testing of gas samples for volatile poisons; (3) emergency procedures in the use of personal equipment and oxygen systems be stressed; and (4) pilots and flight surgeons be made aware of the possibility of intoxication from fuel fumes.

4025
Davis, H.,
I. Tasaki, C. A. Smith, and B. H. Deatherage
COCHLEAR POTENTIALS AFTER INTRACOCHLEAR INJECTIONS AND ANOXIA [Abstract]. — Federation Proceedings, 14 (1[I]): 35-36. March 1955. DLC (QH301.F37, v. 14)

Small quantities of salt solutions were injected into the scala media of the basal turn of the guinea pig while endolymphatic DC potential was recorded through the injection pipette. Simultaneously the cochlear microphonic (CM), action potential (AP), and the summating potential (SP) in response to 5000 c.p.s. tone pips were recorded from other intracochlear electrodes. Cessation of respiration abolished AP and greatly depressed CM and DC. Following a single gasp, DC returned in less than 3 seconds from less than 50% to its full normal value. SP was greatly affected in complicated fashion by anoxia and by ionic changes. The results suggest a more immediate dependence of the endolymphatic DC potential on an oxidative mechanism than on ionic concentration differences. (From the authors' abstract)

4026
Davis, R. C.,
A. Lundervold, and J. D. Miller
THE PATTERN OF SOMATIC RESPONSE DURING A REPETITIVE MOTOR TASK AND ITS MODIFICATION BY VISUAL STIMULI. — Indiana Univ., Bloomington (Contract Nonr 908-03). Technical Report no. 3, April, 1955. 21 p. AD 84 883 PB 136 838

Continuous records of nine somatic response variables were made under the following experimental conditions: (1) listening to a metronome, (2) tapping, (3) visual stimuli (pictures) during tapping,

and (4) maximum rate tapping. A general response pattern indicative of increased motor and sympathetic activity was observed during all experimental conditions. The principle changes occurring during metronome listening were increased sweat gland activity, acceleration of pulse, deeping of breathing, and peripherel vasoconstriction. Continued tapping moderated these effects, and produced a shortening of the breathing cycle and an increase in electromotor activity. With presentation of visual stimuli, pulse rate acceleration and muscular activity were inhibited, other variables were increased. Maximum-rate tapping increased the general response variables within individuals under different stimulus conditions. The muscle response to combined stimuli was not the sum of responses to separate stimuli; other response variables (except respiratory) approximated the sum of separate responses.

4027
David, T. R. A.,
and J. Mayer
DEMONSTRATION AND QUANTITATIVE DETERMINATION OF THE CONTRIBUTIONS OF PHYSICAL AND CHEMICAL THERMOGENESIS ON ACUTE EXPOSURE TO COLD. — Amer. Jour. Physiol. 181 (3): 675-678. June 1955. DLC (QP1.A5, v. 181)

Chemical and physical fractions of thermogenesis have been differentiated by application of high-frequency electromagnetic irradiation and curarization of rats during exposure to cold. Curarization, which suppresses muscular contractions, eliminates 60% of the cold-induced increase in metabolism, and electromagnetic irradiation appears to eliminate the remaining 40%. It is suggested that body temperature in cold is regulated by two mechanisms, one of which is dependent on the difference between the temperature of the central body and of the cold-sensitive organs at the surface, and controls physical thermogenesis; the other is based on central body temperature and controls chemical thermogenesis.

4028
Davis, T. R. A.,
and J. Mayer
NATURE OF THE PHYSIOLOGICAL STIMULUS FOR SHIVERING. — Amer. Jour. Physiol., 181 (3): 669-674. June 1955. DLC (QP1. A5, v. 181)

The relationship between skin and body temperature and onset of shivering was determined during exposure to cold (5° C.) in unshaved and shaved normal rats, in hereditarily obese mice easily made hypothermic by the failure of chemical thermogenesis, and in rats made hyperthermic by deep electromagnetic irradiation. In normal rats, shivering was found to be essentially correlated with overall body skin temperature. It occurred earlier and was more intense in shaved animals, and occurred in both groups well before any fall of central temperature. In normally hypothermic animals exposed to cold, shivering ceased with no change in body temperature when skin temperature was raised by exposure to a heat lamp. When body temperature was below 31° C., however, a rise in skin temperature had no effect on shivering. In hyperthermic animals, shivering was induced while body and skin temperature rose, and only tail temperature fell. It is postulated that the physiologic stimulus for shivering is dependent on the difference between the temperature of cold-sensitive surface organs and central temperature. The rapidity of changes in reflex muscular activity (representing a lesser degree of shivering) in response to cold exposure suggests that the response is neurologically mediated.

4029
Dawson, J. F.,
and W. A. Hiestand
INFLUENCE OF CHLORPROMAZINE (THORAZINE) ON BODY TEMPERATURE CONTROL IN SMALL MAMMALS AND ANOXIC RESISTANCE [Abstract]. — Federation Proceedings, 14 (1[I]): 36. March 1955. DLC (QH301.F37, v. 14)

The body temperature of adult mice and rats fell to 11.7-13.8° C. in 1.5-3.5 hours after injection of chlorpromazine and exposure to an ambient temperature of 3° or 7.5° C. Animals kept at 27° showed a fall of an average of 23.1-26.6° in 1-1.5 hours followed by a gradual rise in temperature. 40% of mice and 60% of rats receiving chlorpromazine died within 3 days after cold exposure. Bacterial examination of the blood and peritoneal fluid of mice showed the presence of pneumococci. Mice treated with 25 mg./kg. chlorpromazine survived submersion in water for 50.8 seconds, while untreated mice survived 42.1 seconds. An increase in dosage to 50 mg./kg. increased survival time to 76.6 seconds.

4030
Debijadi, R.
[ON PILOT FATIGUE] O zamoru kod pilota. — Vojnosanitetski pregled (Beograd), 12 (9-10): 541-543. In Serbo-Croatian. DLC (RC970.V63, v. 12)

The causes of pilot fatigue are complex; apart from general fatigue-inducing factors (physical exertion etc.) there are factors derived from flight activity (low barometric pressure, vibration, noise, acceleration, and nervous tension). In pilot fatigue the dominant symptom is nervous fatigue which manifests itself in deterioration of psychomotor functions. Under normal conditions and in good weather piloting should not be extended beyond 6 hours without adequate rest. Periods of flight duty should be properly spaced to avoid chronic fatigue. Special attention is to be given to piloting in bad weather, at high speed, or in combat missions. A close cooperation of flying personnel, flight surgeons, physiologists, and psychologists is needed to avoid, recognize, and treat pilot's fatigue.

4031
De Corral, J. M.,
and A. Sálces
[EFFECT OF ANOXIA ON SALINE DIURESIS AND PHLORHIZIN POLYURIA] Influencia de la anoxia sobre la diuresis salina y la poliuria florizínica. — Revista española de fisiología (Barcelona), 11 (1): 35-48. March 1955. In Spanish, with English summary (p. 47). DNLM

Phlorhizin-induced glycosuria and polyuria were not modified in dogs rendered anoxic by breathing a mixture of 5% oxygen in nitrogen. The decrease of diuresis in these animals may be attributed to decreased glomerular filtration rather than to anoxia. In saline-induced diuresis, an increase was noted in glomerular filtration simultaneously with a decrease in the tubular reabsorption of water. No changes in polyuria were noted when the animals were exposed to anoxia. In both groups of polyuric animals, rebreathing of environmental air following anoxia gradually re-established the pre-anoxic diuretic and glomerular filtration rates. (Authors' summary, modified)

4032
De Corral, J. M.,
and A. Sálces
[EFFECT OF ANOXIA ON URINARY SECRETION] Influencia de la anoxia sobre la secreción de la orina. — Revista española de fisiología (Barcelona), 11 (1): 1-34. March 1955. In Spanish, with English summary (p. 32). DNLM

Thirteen dogs rendered anoxic by breathing a mixture of 10% O_2 in N_2 exhibited no changes in renal function. When 5% O_2 was used, urinary excretion increased but diminished with prolonged exposure to anoxia. During anoxic diuresis the tubular re-absorption of water decreased in all animals, glomerular filtration increased in some and in others remained constant. Oliguria induced by prolonged anoxia coincided with a gradual increase in glomerular filtration. During diuresis in dogs rebreathing environmental air, glomerular filtration increased in most animals, whereas water re-absorption remained decreased in some and normal in others. A decrease in urinary volume was noted, but urinary concentration and density remained the same. It is concluded, that anoxia decreases tubular re-absorption of water and may even increase glomerular filtration, both changes causing anoxic diuresis, which ceases when anoxia is prolonged. No changes were observed in blood chlorides, non-protein-nitrogen or creatinine, nor were albumin, cylinders, or abnormal cells found in the urine. (Authors' summary, modified) (49 references)

4033
Deese, J. 1955
SOME PROBLEMS IN THE THEORY OF VIGILANCE. — Psychol. Rev., 62 (5): 359-367. Sept. 1955. DLC (BF1.P7, v. 62)

The present concept of vigilance is discussed together with alternative hypotheses concerning the exact nature of stimulus events necessary for maintenance of vigilance.

4034
De Franciscis, P.
[THE SPLEEN AND THE MAXIMUM TOLERABLE ALTITUDE (CEILING LEVEL) IN MONKEYS] La milza e l'altitudine massima tollerabile (ceiling level) nelle scimmie. — Rivista di medicina aeronautica (Roma), 18 (3): 655-681. July-Sept. 1955. In Italian, with English summary (p. 678). DLC (TL555.A1R5, v. 18)

Monkeys were decompressed at a rate of 333 meters per minute to various altitudes until a simulated altitude of 10,033 meters was reached. The maximum tolerable altitude (ceiling level) was determined as the time when the animal did not respond to stimulation (bell sound and slight electroshock). The persistence of consciousness for 30 minutes at 7,000 meters was observed as the maximum tolerance to anoxia. All monkeys, except one, showed a marked decrease of their ceiling level after splenectomy, a decrease not observed following simple laparotomy. The spleen appears to have a specific and important function, hormonal in nature, indispensable in overcoming hypoxic deficiency.

4035
De Langen, C. D.
[THE EFFECT OF A STAY AT HIGH ALTITUDE AND OF THE CHANGE IN ALTITUDE ON THE HEART PATIENT] De invloed van het verblijf op grote hoogte en de wisseling in hoogte, op de hartpatiënt. — Nederlandsch tijdschrift voor geneeskunde (Amsterdam), 99 (35): 2583-2589. Aug. 27, 1955. In Dutch. DNLM

High-altitude factors which exert a detrimental influence on the cardiovascular system are discussed in reference to patients with heart or circulatory disorders. Cardiovascular adaptation to decreased oxygen partial pressure is reviewed as it occurs in the healthy individual and in patients with defective coronary circulation, thrombosis, and hypertension. Flight is contra-indicated for coronary sclerosis patients with (a) heart decompensation, (b) coronary infarct within the last four months, (c) susceptibility to attacks of angina pectoris, or (d) repeated bundle-block symptoms.

4036
Dell, P.,
and M. Bonvallet
[PHYSIOLOGY OF PERIPHERAL THERMOSENSIBILITY AND CENTRAL THERMOREGULATORY MECHANISMS] Physiologie de la thermo-sensibilité périphérique et des mécanismes thermorégulateurs centraux. — Archives des sciences physiologiques (Paris), 9 (4): C83-C99; discussion, p. C100-C101. 1955. In French. DNLM

A review is presented of experimental observations of the role and function of the cutaneous and central thermomechanisms in the perception and regulation of body temperature. Electrophysiological studies to determine the location and mode of action of the central thermoregulatory system are described, including experiments to demonstrate the existence of a thermoregulatory center in the preoptic region, responsive chiefly to changes in the temperature of the blood, and studies of the response to cold after cerebral lesion or section, particularly in the region of the hypothalamus. It is concluded that the peripheral thermoreceptors affect the tone and level of activity of the central thermoregulatory mechanism by the frequency of their discharge.

4037
Dempsey, C. A.,
T. H. Grenier, D. Chiles, N. R. Burch, D. Warren, N. E. Schmitt, and J. E. Steele
56 HOURS IN JET PLANES. — Science News Letter, 67 (14): 211. April 2, 1955. DLC (Q1.S76, v. 67)

A brief report is presented on the trial confinement of four airmen in full flying gear who remained in the cockpit of a grounded F-84 plane for 56 hours. Psychological and physiological responses were measured. The men did not show signs of major stress although their condition and mental performance deteriorated during the last four hours of the experiment. The g-suit was found to keep the muscles from getting stiff and cramped.

4038
Dempsey, E. W.,
and R. R. Peterson
ELECTRON MICROSCOPIC OBSERVATIONS ON

THE THYROID GLANDS OF NORMAL, HYPOPHYSECTOMIZED, COLD-EXPOSED AND THIOURACIL-TREATED RATS. — Endocrinol., 56 (1): 46-58. Jan. 1955. DLC (QP187.A25, v. 56)

Thin sections of thyroid glands from normal and physiologically altered rats were studied by electron microscopy. Exposure to cold of 5° C. for seven days produced an increase in thickness of the follicular cells and dilation of the ergastoplasmic sacs. The lumens of the sacs contained a colloid-like substance which apparently represented the colloid droplets produced by cold stimulation.

4039
Dempster, W. T.
SPACE REQUIREMENTS OF THE SEATED OPERATOR; GEOMETRICAL, KINEMATIC, AND MECHANICAL ASPECTS OF THE BODY WITH SPECIAL REFERENCE TO THE LIMBS. — Univ. of Michigan, Ann Arbor (Contract AF 18 (600)-43); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-159, July 1955. xx+254 p. (Project no. 7214). UNCLASSIFIED

The structure of the limb joints and the range and type of their motions were studied in cadaver material and in living subjects to obtain information on geometric, kinematic, and engineering features of the limb mechanism. Subjects comparable to the model physique of Air Force flying personnel and highly selected small samples of muscular, thin, and rotund builds supplied information on the range of possible hand and foot movements consistent with the seated posture. Maximum dimensions of the work space for seated individuals were determined and the potential utility of different regions within reach was evaluated. Plans were developed for the construction of manikin joints and drafting board manikins showing normal ranges of limb movement. Eight cadavers were dismembered to provide data on the mass, segment centers of gravity, density, and moments of inertia of body parts. The distribution of body bulk was also determined in living subjects. Application of the data to analyses of horizontal push and pull forces permitted an evaluation of the effectiveness of body mass, leverages, and support areas. (172 references) (Author's abstract, modified)

4040
Denison, M. E.,
R. L. Jasper, W. A. Hiestand, and M. X. Zarrow
EFFECT OF CASTRATION, TESTOSTERONE PROPIONATE AND EXPOSURE TO COLD ON TISSUE RESPIRATION IN THE MALE RAT [Abstract]. — Federation Proceedings, 14 (1[1]): 37. March 1955. DLC (QH301.F37, v. 14)

The oxygen consumption of kidney, brain, and liver slices was determined in orchidectomized rats, rats treated with testosterone propionate, and rats exposed to cold. Slight changes in oxygen uptake were noted in intact animals exposed to cold for 15 days, and a marked increase of 35-55% for all tissues was observed at 50 days.

4041
Denois, F. M.
[SAFETY AND RESCUE IN FLIGHTS OVER THE SEA] Prevención y rescate en vuelos sobre el mar. — Ciencia aeronáutica (Caracas), 2 (13): 53-54. Dec. 1955. In Spanish. DLC

Emergency procedures are briefly discussed for the aircrew and passengers in plane ditching at sea. Evacuation of the plane is proposed in a safe, efficient and calm manner. Passenger obedience to the aircraft captain is stressed. Instructions are presented for passengers to follow prior to ditching. Mention is made of survival and rescue maneuvers.

4042
DENTAL SERVICE. — U. S. Air Force Medical Service Digest, 5 (7): 22-24. July 1954. DLC

The history, functions, accomplishments, and recruitment problems of the U. S. Air Force Dental Service are briefly discussed.

4043
Department of the Air Force
EYE PROTECTION FOR MILITARY AND CIVILIAN INDUSTRIAL WORKERS. — Department of the Air Force, Washington, D. C. Air Force Pamphlet no. 160-6-10, Sept. 15, 1955. ii+7 p. DNLM

Directions are presented for the implementation of an eye protection program (AFR 160-112) for civilian and military industrial employees of the Air Force, consisting of vision testing, evaluation of eye-hazardous job environments, establishment of job vision requirements, and procurement of protective and/or corrective eye wear.

4044
Department of the Air Force
NIGHT VISION TRAINER. — Department of the Air Force, Washington, D. C. Air Force Manual no. 50-10, June 1955. 31 p. DLC (UG633.A47 19551)

Instructions are presented for the use of a night vision trainer designed to train flying personnel in the efficient use of their visual apparatus under night flying conditions. The trainer consists of a projector which simulates the problem of spotting aircraft against backgrounds of varying contrast and at changing levels of illumination by a system of slides and filters. The anatomy of the eye, types of vision, phenomena and problems of night vision, and aids to dark adaptation are also discussed.

4045
[Department of the Air Force (U. S.)]
1955 USAF INSTRUMENT SYMPOSIUM. — Final Report, [April 1, 1955]. xi+228 p. AD 69 601 UNCLASSIFIED

Brief accounts of discussions, conclusions, and recommendations of seminar study groups included in the 1955 Air Force Symposium held Feb. 13-19, 1955, at Moody Air Force Base, Georgia, are presented. The purpose of the Symposium was to utilize the wide range of experience of delegates from the major commands, commercial airlines, and the Civil Aeronautics Administration to establish criteria for aircraft suited for low and high speed instrument instruction. The principal recommendations of the symposium concern cockpit and instrument design, jet and conventional aircraft trainers, air traffic control systems, approach light systems, and runway length criteria.

4046
deRivera, J. H.,
and W. B. Webb
CORRELATIONS BETWEEN DYNAMIC VISUAL ACUITY AND PERSONALITY TESTS. — In: Research notes from the Aviation Psychol. Lab., p. 9-11. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 109 107. 01, March 15, 1955. AD 74 676
UNCLASSIFIED

Two parameters (static acuity and rate of deterioration of acuity with increasing velocity) involved in the visual tracking of rapidly-moving objects were correlated with the scores of 117 naval air cadets on five psychological tests. No significant correlation was found between the parameters tested and scores obtained on a general intelligence test (AQT), a spatial apperception test (SAT), mechanical comprehension test (MCT), the Taylor Manifest Anxiety Scale, and a biographical inventory correlated with success in the Naval Air Training Program.

4047
De Rivera, J. H.,
and W. B. Webb
THE EFFECT OF DISTRIBUTION OF PRACTICE ON LEARNING TO TRACK WITH THE EYE [Abstract]. — Amer. Psychologist, 10 (8): 495-496. Aug. 1955. DLC (BF1.A55, v. 10)

A sample of 102 subjects viewed monocularly the image of a Landolt ring as it moves by on a revolving mirror. Each subject had to indicate the direction of the ring's opening. Group A saw an image every 14 seconds, group B saw one every 7 seconds, group C every 3.5 seconds. The same size ring was used for all subjects over 50 successive trials. Approximately the same number of people in each group reached a criterion of 6 out of 10 correct. However, the more massed the practice, the fewer number of trials were required to reach the criterion. A three-way analysis of variance between massing conditions, individuals and trials showed significant differences at the .001 level in favor of massed practice.

4048
DesMarais, A.
[THYROID-ADRENAL RELATIONS IN COLD ADAPTATION] Relations thyroïde-surrénales dans l'adaptation au froid. — Canad. Jour. Biochem. and Physiol. (Ottawa), 33 (6): 1018-1032. Nov. 1952. In French. DLC (R11.C37, v. 33)

A review is presented of the literature dealing with the relationship between the thyroid and adrenal glands and their role in the defense of the body exposed to cold. Experiments on normal, adrenalectomized, thyroidectomized, and adrenalectomized-thyroidectomized rats treated with various doses of cortisone and thyroxine demonstrate a quantitative relation between thypoxine and cortisone. Thyroxine administration can prevent the catabolic action of cortisone in cold-exposed animals. It appears that exposure to cold is not a stress if the increase in thyroid function is sufficient to meet body requirements. It has also been observed that ascorbic acid administration can reduce the catabolic effects of cold exposure, and can decrease the degree of thyroid hyperactivity in cold-exposed animals. It may be assumed that ascorbic acid may in some way diminish the thyroid hormone requirements of cold-exposed animals. (69 references)

4049
DesMarais, A.,
and P. M. Gagnon
[EFFECT OF EXPOSURE TO COLD ON THYROID ACTIVITY AND ON WEIGHT AND ASCORBIC ACID CONTENT OF THE ADRENALS IN THE GUINEA PIG DEFICIENT OR NOT IN ASCORBIC ACID] Influence de l'exposition au froid sur l'activité thyroidienne et sur le poids et la teneur en acide ascorbique des surrénales chez le Cobaye carencé ou non en acide ascorbique. — Comptes rendus de la Société de biologie (Paris), 149 (15-18): 1714-1718. Aug.-Sept. 1955. In French.
DLC (QP1.S7, v. 149)

Guinea pigs deprived of vitamin C for 21 days were exposed for six days to a temperature of 10± 1° C., and the rate of growth, weight of the adrenal glands, ascorbic acid content of the adrenals, and thyroid activity, measured by the thickness of the vesicular epithelium, were determined in comparison with vitamin C-fed animals and warm controls. The vitamin C-deficient animals showed a slowing of growth from the twelfth day, with a progressive loss of body weight from the eighteenth day, which was not aggravated by exposure to cold. The adrenal glands increased in weight and showed retention of ascorbic acid after exposure to cold. Thyroid activity was increased. Ascorbic acid-fed animals showed a decreased rate of growth after exposure to cold. No increase in weight of the adrenals was observed, but ascorbic acid was retained by these glands. Thyroid activity was unaffected.

4050
DesMarais, A.
SKIN METABOLISM IN RATS EXPOSED TO COLD. — Canad. Jour. Biochem. and Physiol. (Ottawa), 33 (5): 758-760. Sept. 1955.
DLC (R11.C37, v. 33)

Sodium ascorbate-treated and non-treated rats kept at room temperature (24° C.) or exposed to cold (+2° C.) demonstrated that: (1) ascorbate administration has no effect on cutaneous succinic dehydrogenase activity at room temperature; (2) exposure to cold enhances the succinic dehydrogenase activity in the skin of untreated animals, and (3) ascorbate administration during exposure to cold prevents the activation of cutaneous succinic dehydrogenase.

4051
Deterling, R. A.,
E. Nelson, S. Bhonslay, and W. Howland
STUDY OF BASIC PHYSIOLOGIC CHANGES ASSOCIATED WITH HYPOTHERMIA. — A. M. A. Arch. Surg., 70 (1): 87-94. Jan. 1955. DNLM

Experiments were conducted to investigate the effects of controlled respiration at defined pressures and rates or adjusted to produce a plasma pH of 7.4 or higher on the acid-base balance of hypothermic dogs. A general decline in blood pH was observed during hypothermia which could be prevented by control of shivering and by hyperventilation. Hypothermia caused little significant change in serum electrolyte concentration, prothrombin time, blood urea nitrogen, blood sugar, and lactic acid, a prolongation in venous clotting time, a progressive fall in blood pressure and

heart rate after a transient increase, and a decline in oxygen consumption. Ventricular fibrillation occurred most frequently below a body temperature of 23° C., but was not observed in animals with elevated blood pH.

4052
DeVogt, J. F.
OPERATION NO STRIP. — Med. Technicians Bull., 6 (3): 93-97. May-June 1955.
DLC (RC970.U72, v. 6)

The training program is presented for medical airmen assigned to medical mobility teams in the Strategic Air Command. Field exercises are described for personnel assigned to air transportable infirmaries and air airborne dispensaries.

4053
DIAL DESIGN CONFUSED PILOTS. — Aviation Age, 24 (5): 172. Nov. 1955. DLC (TL501.A8187, v. 24)

Navigational reading errors were consistently made on a flight simulator when the numerals "6" and "9", representing 60-degree and 90-degree headings, were rotated into the lower quadrant of the radio magnetic indicator dial. The confusion was eliminated by replacing the numerals representing the cardinal points of the compass by the letters, N, S, E, and W.

4054
Diamant, H.
[MOTION SICKNESS: HISTORY, ETIOLOGY, AND PATHOGENESIS] Rörelsesjuka (motion sickness): Historisk, etiologi och patogenes. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (2): 7-9. 1955. In Swedish. DNLM

This article reviews the major contributions to the study of motion sickness since World War I; the development of remedies; and the side-effects of various anti-motion sickness drugs. The author's own experiments with Dramamine are mentioned. In these caffeine was used to reduce drowsiness. Other Swedish investigators have employed lergigan-amphetamine. The vestibular syndrome, produced in rabbits by injecting nerve gas, was successfully counteracted by atropine and certain antihistaminics.

4055
Diamond, A. L.,
and A. S. Gilinsky
DARK-ADAPTATION LUMINANCE THRESHOLDS FOR THE RESOLUTION OF DETAIL FOLLOWING DIFFERENT DURATIONS OF LIGHT ADAPTATION. — Jour. Exper. Psychol., 50 (2): 134-143. Aug. 1955. DLC (BF1.J6, v. 50)

Same as item no. 294, vol. I.

4056
Dickinson, T. A.
AN AMERICAN GROUND TEST SILENCER. — Aircraft Engineering (London), 27 (315): 165. May 1955. DLC (TL501.A5615, v. 27)

A brief description is presented of a silencer used in the ground testing of jet engines which attenuates sound waves from an intensity of 148 to 108 decibels at a point 100 feet away from their source. Structurally, it differs from steel installations, which tend to propagate rather than to attenuate sonic vibrations, by utilizing Scoria blocks (concrete bricks containing large quantities of expanded volcanic ash).

4057
Dickson, E. D. D.,
and P. F. King
THE RESULTS OF TREATMENT OF OTITIC AND SINUS BAROTRAUMA. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 913, March 1955. 12 p. AD 65 156 UNCLASSIFIED
Also French translation: Les résultats du traitement des barotraumes de l'oreille et des sinus. — Force aérienne, Service de santé, Bulletin technique d'information [Bruxelles], 2 (4): 2-14. Dec. 1955. DNLM

A total of 328 cases of barotrauma, including 250 cases of otitic and 100 cases of sinus barotrauma, have been treated at the Central Medical Establishment during a period of three years. 70% of the cases of otitic barotrauma were returned to full flying, 12% were given restricted flying duty, and 18% were grounded. In cases of sinus barotrauma, 63% were returned to full flying, 17% to restricted flying, and 15% were grounded. Cases treated surgically had a higher rate of return to flying than cases given simple treatment. Deep X-ray therapy in cases of chronic otitic barotrauma enabled 56% of patients who would otherwise have been grounded to return to flying duty. Rupture of the tympanic membrane in 16 cases of otitic barotrauma had no apparent effect on the ultimate disposal of the patients.

4058
DID YOU GET YOURS TODAY? — U. S. Navy Med. News Letter, 25 (12): 32-34. June 24, 1955. DNLM

Nearly 65% of all aircraft accidents are attributed to pilot error. Various connotations are possible: (1) the pilot errs through lack of training and because of unfamiliarity with the aircraft; (2) an unusual event interrupts a habitual sequence of action, as in landing the pilot forgets to put the wheels down; (3) a physiological stress incapacitates the pilot; (4) the pilot is psychologically unfit and reacts inadequately to an emergency or takes an unnecessary change; (5) the pilot is overcome by a toxic agent or disease process; and (6) the performance of the aircraft outstrips the capabilities of the pilot. The flight surgeon's role is discussed in the prevention of accidents caused by pilot error, and in determining the source of error as precisely as possible when accidents do occur.

4059
Di Giorgio, A. M.
[THE STRUGGLE TO CONQUER HIGH ALTITUDE] La lotta per la conquista della alte quota. — Minerva medica (Torino), 46 (2): 686-689. March 14, 1955. In Italian. DNLM

No significant changes in respiratory activity were observed in mountain climbers and various subjects at sea level (Torino), or at high altitudes (Plateau Rosà, 3,500 meters, or Col d'Olen, 3,000 meters). However, an increase in respiratory activity was noted when the subjects rebreathed a mixture of 7.5% oxygen in nitrogen at sea level or rebreathed environmental air at high altitude. Both at sea level and at high altitudes cardiac frequency was found to be normal in most subjects, and somewhat lower in others. During rebreathing of

oxygen deficient mixtures, cardiac frequency showed an increase and electrocardiographic tracings indicated a reduction of electrical diastole and modifications in the T wave. No significant changes in oxygen consumption were demonstrated in hypoxic conditions.

4060
Digo, R.
[PSYCHOPATHOLOGICAL OBSERVATIONS ON TRAUMATIC NEUROSES IN FLYING PERSONNEL] Aperçu psychopathologique sur les nevroses traumatiques dans le personnel navigant de l'aviation. — Hygiène mentale (Paris), 44 (1): 3-18. 1955. In French. DNLM

The psychopathological aspects are presented of five cases of traumatic neuroses in flying personnel who were involved in a flight accident, or a simple flight incident during landing or take-off. The traumatism is emotional in nature with manifestations of anxiety, insomnia, depression, frustration, and limitations in the field of activity and interest. A brief description is given of the symptoms and prognosis. Therapy consists chiefly of rest, sedatives, psychotherapy, and a rest from flying. The value is stressed of psychological examinations during selection in determining which candidates may be predisposed to traumatic neuroses, and of the periodical medical and psychological screening of flight personnel to detect the appearance of any signs of the disorder.

4061
Diringshofen, H. von
LONG CHAIR POSITION FOR FIGHTER PILOTS. — Jour. Aviation Medicine, 26 (6): 467-470. Dec. 1955. DLC (RC1050.A36, v. 26)

This is a discussion of the "long chair" position, a semisupinated posture, which the author believes will increase pilot tolerance to g force up to a limit of 8 g's when the force is acting at a 45-degree angle to the vertical. The distance between the heart level and the level of the eyes is decreased by about 5 cm. when this position is assumed; the pilot can withstand accelerations of 7 g if the systolic arterial pressure at heart level reaches 155 to 170 mm. Hg, and 8 g if the blood pressure is at 170 to 185 mm. Hg. There is also considerable improvement in the venous flow from the lower parts of the body; increased intra-abdominal pressure on the inferior vena cava contributes to this process. An anti-g suit with a pressure cuff around the abdomen or an increased weight in the abdominal belt will facilitate the increase in blood pressure.

4062
DITCHING AND WATER CRASH INJURY DETAILS. — U. S. Naval Aeromedical Safety Jour., 1 (1): 15-23. 1955. DNLM

Statistical data concerning ditchings and water crashes in the U. S. Navy from June to December, 1954, are presented. Information is given concerning plane type, time in water or raft, air and water temperature, method of rescue, survival equipment used, aircraft position, and impact altitude. Medical reports of selected cases of ditching are presented.

4063
Doesschate, G. ten
EYES WITH NORMAL VISUAL ACUITY WITHOUT GLASSES. — Acta ophthalmologica (Copenhagen), 33 (1): 1-12. 1955. In English. DNLM

This paper contains the numerical data obtained from the eye examinations of 1000 pilot-applicants with normal vision to the Netherlands civil and military aviation.

4064
Doesschate, G., ten
HETEROPHORIA. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 186-194. London: Butterworth Scientific Publications, 1955. DLC (TL500.N6, no. 6)

Variability in the extent of heterophoria was observed in most subjects tested after (1) a focal shift from 6 m. to 33 cm., (2) a focal shift from 6 to 50 m., (3) a shift in position of the Maddox Rod from the right to the left eye, and (4) examination at short (2 hour) or long intervals. The use of an arbitrary standard for elimination of heterophoric pilots is thus questioned. Although a correlation exists between depth discrimination and esophoria, no correlation has been found with exophoria. It is suggested that good depth perception is essential only in close formation flying and in the landing of a helicopter.

4065
Doesschate, G. ten,
and J. ten Doesschate
THE INFLUENCE OF THE STATE OF ADAPTATION ON THE STEADY POTENTIAL OF THE HUMAN EYE. — Aeromedica acta (Soesterberg, Netherlands), 4: 138-150. 1955. In English. DNLM

The change in resting potential of the human eye during dark and light adaptation was measured by the amplitude of the electro-oculogram in standardized horizontal eye-movements. During dark-adaptation the positive resting potential decreases at first until a minimum is reached in 10 minutes. Then it rises again to reach a steady value slightly lower than the initial potential value during preceding light adaptation. In re-adaptation of the eye to light the resting potential remains constant for the first 3 or 4 minutes, then it rises until a steady level is attained approximately 10 minutes after the beginning of light adaptation. A hypothesis is proposed which attributes a positive potential to rods and a negative potential to cones. During dark adaptation the resting potential of both rods and cones increases. The shape of the curve is determined by the different time characteristics of cone and rod adaptation. (From the authors' summary)

4066
Doesschate, G. ten,
and J. Kylstra
THE PERCEPTION OF PARALLELS. — Aeromedica acta (Soesterberg, Netherlands), 4: 115-119. 1955. In English. DNLM

Two experiments were performed to investigate the constancy of the impression of parallelism and convergence towards a common point in space. Under conditions of the second experiment involving viewing along three horizontal parallel tubes the impression of parallelism became dissociated from convergence, which is at variance with the rule of central projection. Four different approaches to explanation of this phenomenon are offered.

4067
Doesschate, G. ten,
and J. T. H. van Weeren
[INTERPUPILLARY DISTANCE AND DEPTH PERCEPTION] Pupil-afstand en diepte-onderscheidingsvermogen. — Nederlandsch tijdschrift voor geneeskunde (Amsterdam), 99 (11): 785-786. In Dutch, with English summary (p. 786). DNLM

Same as item no. 2673, vol. III.

4068
Doesschate, G. ten
SOME REMARKS ON HETEROPHORIA. — Aeromedica acta (Soesterberg, Netherlands), 4: 18-21. 1955. In English. DNLM
Also published in: Folia psychiatrica neurologica et neurochirurgica neerlandica (Amsterdam), 58 (4): 236-239. 1955. In English. DNLM

A slight degree of heterophoria is a frequently encountered condition and not be regarded as pathological. In itself it does not lead to asthenopia without precipitating factors such as fatigue, illness, mental stress, hypoxemia, or intoxications. It is impossible to determine the exact degree of eye-muscle imbalance, as different methods of examination give widely divergent results and the condition itself fluctuates in time. Complaints of asthenopia can often be alleviated by a prism; however, the author believes this to be due to factors other than an exact neutralization of the eye deviation.

4069
Doesschate, G. ten
VISUAL ACUITY AND ILLUMINATION. — Aeromedica acta (Soesterberg, Netherlands), 4: 127-137. 1955. In English. DNLM

The influence of wall-chart and room illumination on the accuracy of visual acuity measurements of pilots was reappraised. Four subjects were tested under nine chart-illumination levels and six room-illumination levels. Visual acuity increased in unequal steps as the illumination level was raised. Recommendations for standardized examination of visual acuity of pilots include adaptation of a uniform level of illumination with exclusion of daylight in the testing room. The author prefers 200 lux for the chart illumination and approximately 40 lux for surrounding illumination.

4070
Doesschate, G. ten,
and J. Kylstra
[THE PERCEPTION TIME] De waarnemingstijd. — Aeromedica acta (Soesterberg, Netherlands), 4: 27-66. 1955. In Dutch, with English summary (p. 66). DNLM

The physiological, psychological, and neurological approaches to measurement of perceptual latency in vision are reviewed. The difficulties in separating perceptual latency and efferent impulses resulting in motor acts are considered, as well as various numerical values arrived at by subtraction process or direct measurement. In aviation the total reaction time including perceptual latency, blinking time, eye movement, and motor reaction time becomes a limiting factor in certain hazardous flight situations involving high-speed aircraft. Examples of such situations are presented. Use of electronic aids to offset human limitations is advised for supersonic aircraft.

4071
Dolivo, M.
D. Megirian, and A. Fleisch
[TONIC RESPIRATORY REFLEXES OF HESS DURING APNEA] Les réflexes toniques respiratoires de Hess durant l'apnée. — Helvetica physiologica et pharmacologica acta (Basel), 13 (3): 257-263. 1955. In French, with English summary (p. 263). DNLM

The electrical activity of the phrenic motor fibers, a measure of the basic tonic innervation of the diaphragm, was recorded in anesthetized rabbits during a state of apnea produced by hyperventilation. The activity increased upon application of negative pressure to the lungs, and decreased upon application of positive pressure. These variations in basic tonus are a measure of the tonic respiratory reflexes described by Hess. It was demonstrated that the time required for the establishment of the reflex after the pressure stimulus has been applied is a direct function of the CO_2 tension of the blood, or of the time from application of the stimulus to spontaneous recovery from apnea. (Authors' summary, modified)

4072
Domanski, T. J.
STRESS CONTRAST IN B-47 AND B-29 TRAINING OPERATIONS. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-80, Oct. 1955. 4 p. AD 94 790 UNCLASSIFIED

Training missions flown in B-47 and B-29 aircraft were studied with respect to the incidence of strain in student aircraft commanders and in instructor pilots. The criterion of strain was the occurrence of a postflight eosinopenia. On this basis the incidence of strain for transition missions was: (a) 60 percent for B-47 instructor pilots, (b) 61 percent for B-47 student aircraft commanders, (c) 22 percent for B-29 instructor pilots, and (d) 28 percent for B-29 student aircraft commanders. The contrast between B-47 and B-29 subjects was statistically significant ($P<0.01$). The physiological findings were in accord with the judgments of senior flying personnel as to the relative difficulty of the missions studied. In the study of instructor-student pairs, it was found that the incidence of strain for student commanders was higher but not significantly different from that of the corresponding instructor pilots. (Author's summary)

4073
Domenici, F.
[LESIONS CAUSED BY EXPLOSIVE DECOMPRESSION] Lesioni da decompressione esplosiva. — Rassenga clinico-scientifica (Milano), 31 (5): 139-141. May 1955. In Italian. DNLM

A postmortem anatomo-pathological analysis is presented of the lesions found in fifteen victims involved in a Comet airplane explosion over the Isle of Elba. Cranial, thoracic, and extremity fractures, burns and lacerations, and organic rupture and hemorrhage were observed. Lesions possibly due to explosive decompression were found in the lungs, liver, intestines, and spleen. It was not ascertained whether cardiac rupture was due to explosive decompression or deceleration. The cause of death of the crash victims may have been due to explosive decompression, deceleration, tossing or projection against aircraft cabin walls and equipment, or by falling into the sea.

4074
Dorris, H. W.
HUMAN ASPECTS OF IN-FLIGHT REFUELING. — Jour. Aviation Med., 26 (2): 117-120. April 1955. DLC (RC1050.A36, v. 26)

A description is given by the pilot of a combat mission flown in a F-80 jet fighter which lasted 14

hours and 15 minutes and utilized the "probe and drogue" technique of in-flight refueling. During the period of the flight, the author states that it was necessary to refuel 6 times from a tanker plane, and he cites the need for perfect depth perception on the part of the pilot of the plane approaching the tanker. He discusses certain equipment problems on this long flight: the Mae West life jacket was so uncomfortable he was forced to remove it after 5 hours; the survival vest was also too bulky; and the P-1 helmet rubbed the back of his neck. This latter inconvenience was particularly annoying, for it was necessary to frequently turn the head in order that a check against enemy attack be maintained. The author further declares that the parachute equipment became extremely uncomfortable. He concludes that a pilot's personal equipment, his ejection seat, and his cockpit layout should be integrated into one entity in order to increase the pilot's mobility and maintain combat efficiency.

4075
Døssing, J.
SHELDON TYPES AND SUCCESS IN FLIGHT PERFORMANCE. — In: North Atlantic Treaty Organization, Anthropometry and human engineering, p. 31-35. London, Butterworths Scientific Publications. 1955. DLC (TL500.N6, no. 5)

Of 211 applicants for aviation training as jet pilots in the Danish Air Force, 88 were accepted, and 50 of these were qualified as jet pilots. The distribution of the Sheldon constitution-typological components in the applicant group did not differ from that of the normal population. Although the qualified group showed a slight tendency towards greater predominance of the mesomorphic (athletic) component, no relationship was observed among the 50 qualified pilots between strength of the mesomorphic component and fitness as pilot. It is suggested that care be taken not to reject applicants because of a relatively low mesomorphic value.

4076
Doty, L. A.,
J. W. Asher, T. D. Hanley, and M. D. Steer
THE RELATIONSHIP BETWEEN LISTENER ACCURACY AND CONCURRENT PSYCHOMOTOR ACTIVITY. — Purdue Univ., Lafayette, Ind. (Contract N6ori-104); issued by Office of Naval Research. Special Devices Center. Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 104-2-43, Oct. 13, 1955. 20 p. (SPECDEVCEN Project 20-F-8). AD 109 245 UNCLASSIFIED

One listening task and three psychomotor tasks of varying difficulty were employed to evaluate the effects on listener accuracy of simultaneously performing a psychomotor task. Four conditions were investigated. In condition A, the subject listened to a recorded list of words and marked down the words he heard without performing a psychomotor task. In conditions B, C, and D the subject, in addition to listening, was required to perform a psychomotor task (B, extinguish lights by pushing one of three hand switches which were in the same relative position as the light; C, extinguish lights by depressing one or both foot pedals which were in the reverse order of the position of the lights; D, extinguish lights by a combination of responses given in B and C). No significant differences were observed in listening accuracy as a function of the complexity of the psychomotor task performed; however, significant increases in errors were found as the task progressed from conditions A through D. (AD abstract, modified)

4077
Doull, J.,
and A. Hasegawa
EFFECT OF INCREASED ENVIRONMENTAL TEMPERATURE ON RADIATION LETHALITY IN RATS. — Federation Proceedings, 14 (1): 333-334. March 1955. DLC (QH301.F37, v. 14)

Observations of weight change and mortality were made in rats exposed to an environmental temperature of 100° F. with relative humidity of 50% before, during, or after whole-body X-irradiation of 400, 600, or 800 r. The median survival time of rats exposed to heat was significantly shortened and the weight loss was more severe than in irradiated animals maintained at room temperature. A progressive daily increase in rectal temperature was observed after the 6th day following exposure in irradiated heat-exposed animals, but not in animals receiving either X-irradiation or heat exposure alone.

4078
Downey, V. M.
AVIATION MEDICINE. — In: The Cyclopedia of medicine surgery and specialties: review service, 1955, p. 207-226. Philadelphia: F. A. Davis Co., 1955. DLC (R125.C96, 1955)

A comprehensive discussion of the medical problems and phenomena associated with aviation is presented to enable the general practitioner to advise his patients on questions of air travel and to make physical examinations of private pilots. Topics discussed include: (1) air sickness; (2) air transportation of patients with cardiac disorders, poliomyelitis, and sicklemia; (3) medical problems of flight crews, including atherosclerosis, diabetes, aerodontalgia, effects of alcohol, and noise; (4) effects of aging on hearing, vision, psychomotor functions, and coronary condition, and their relation to flying; and (5) the physiological basis for pressure cabins, pressure breathing, oxygen equipment, and pressure suits, and the problems of rapid decompression and glare.

4079
Draper, J.,
A. M. Reid, and E. T. Renbourn
PHYSIOLOGICAL DATA DERIVED FROM A TRIAL OF A WATER IMPERMEABLE-WATER VAPOUR PERMEABLE GARMENT [Abstract]. — Jour. Physiol. (London), 127 (3): 58P-59P. March 28, 1955. DLC (QP1.J75, v. 127)

In a statistical analysis of results of the testing of clothing made from oilskin or "Vapotex", a water-vapor-permeable thin rubber coating on light-weight cotton, it was found that (1) post-work measurements were more sensitive in showing differences between the materials than temporal difference measurements; (2) pulse rate, rectal temperature, skin temperature, and sweat loss separately showed differences between the materials; and (3) mean skin temperature was the most sensitive measure, followed by mean body temperature, rectal temperature, and sweat loss.

4080
Dréan, J.
[THE STRUGGLE AGAINST NOISE] La lutte contre le bruit. — (Thesis, Faculté de médecine, Paris, 1955). 42 p. In French. DNLM

A brief review of the literature on the occurrence and pathology of noise-induced deafness is presented. Stages in the course of hearing impairment through prolonged exposure to noise are described, including (1) adaptation during the first month of exposure, with a maximum hearing loss of 40 db. at 4000 c.p.s.; (2) total latency, in which a V-shaped rise in auditory threshold extends from 2000 c.p.s. to 8000 c.p.s., with a maximum at 4000 c.p.s.; (3) subtotal latency, in which there is difficulty in hearing the whispered voice; and (4) manifest deafness, in which there is difficulty in hearing the conversational voice. Legislative measures for the control of urban noise and for compensation of workers with noise-induced hearing loss are briefly reviewed.

4081
Duane, T. D.,
E. L. Beckman, J. E. Ziegler, and H. N. Hunter
SOME OBSERVATIONS ON HUMAN TOLERANCE TO ACCELERATIVE STRESS. III. HUMAN STUDIES OF 15 TRANSVERSE G. — Jour. Aviation Med., 26 (4): 298-303. Aug. 1955. DLC (RC1050.A36, v. 26)

Essentially the same as item 1332 (vol. II).

4082
Ducros, E.
[ELEMENTARY BIOMETRIC MEDICAL STATISTICS RELATIVE TO FLYING PERSONNEL OF THE FRENCH AIR FORCE] Statistiques de biométrie médicale elémentaire relatives au personnel navigant de l'Armée de l'Air française. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Anthropometry and human engineering, p. 18-30. London: Butterworths Scientific Publications, 1955. In French. DLC (TL500.N6, no. 5)

Statistical data concerning the body measurements of a large sample of aviation candidates of the French Air Force are presented. The physical measurements required of candidates for acceptance as student fighter pilots are (1) height, 160-183 cm. (60-73 in.); (2) weight, 50-81.5 kg. (110-177 lbs.); (3) minimum leg length, 99 cm. (40 in.); and (4) maximum Pignet-Mayet index (optional), 30. The chief findings of the statistical analysis are that (a) 95.7% of the candidates met the requirements for height, with an average of 170 cm. (68 in.); (b) 96.9% met the requirements for weight, with the majority between 59 and 70 kg. (130-154 lbs.); (c) 99.1% met the requirements for leg length, with 73.4% between 104 and 113 cm. (42-45 in.); (d) 94-99% had a Pignet-Mayet index less than 30; (e) 74.6% of candidates aged 18-24 years and 63.7% aged 25-30 years had a chest circumference of 86-94 cm. (34-38 in.); (f) 83.3% had a head circumference of 555-600 mm. (22-24 in.); (g) 72.6% had a forearm length of 450-489 mm. (16-20 in.); and (h) 66.5% had a nose-to-chin distance of 104-116 mm. (4-5 in.).

4083
Ducros, E.,
and R. Gregoire
[TRAUMATOLOGY OF AERIAL ACCIDENTS OCCURRING IN THE AIR FORCE IN 1953] Traumatologie des accidents aériens survenus dans l'Armée de l'Air en 1953. — Médecine aéronautique (Paris), 10 (2): 141-147. 1955. In French. DLC (TL555.M394, v. 10)

Injury and death statistics for all aerial accidents of the French Air Force in 1953, classified according to type of injury and type of aircraft, are presented.

4084
Dufour, D.,
and L. P. Dugal
[EFFECT OF SOMATOTROPIC HORMONE ON THE RESISTANCE OF THE RAT EXPOSED TO COLD] Effet de l'hormone somatotrope sur la résistance du Rat exposé au froid. — Comptes rendus de la Société de biologie (Paris), 149 (21-22): 2056-2060. Nov. 1955. In French. DLC (QP1.S7, v. 149)

Rats were treated with somatotropic hormone for 12 days and during a subsequent exposure for 9 days to a temperature of −7.5°C. The rate of growth of treated animals, although reduced sharply during exposure to cold, was found to be greater than in untreated cold-exposed animals. Further exposure for 9 days after discontinuance of treatment caused a loss of weight, a decrease in survival rate from 100% to the approximate level in untreated animals of 50-60%, and a decrease in retained protein-free nitrogen to untreated values.

4085
Dugal, L. P.,
A. DesMarais, and P. M. Gagnon
INFLUENCE OF EXPOSURE TO COLD AND ASCORBIC ACID ADMINISTRATION ON THE WEIGHT AND THE METABOLIC ACTIVITY OF THE ADRENAL GLAND OF HYPOPHYSECTOMIZED RATS GIVEN ACTH. — Canad. Jour. Biochem. and Physiol. (Ottawa), 33 (4): 677-680. July 1955. DLC (R11.C37, v. 33)

Modification of the response of the adrenal gland to ACTH was observed in hypophysectomized rats exposed to cold with or without ascorbic acid treatment. Changes in weight and metabolic activity of the gland were used to measure the adrenal response. All comparisons were made between the left and the right adrenal of each animal before and after treatment. The results obtained show that cold stress increases the response of the adrenal to a standard dose of two units of ACTH; they also indicate that ascorbic acid administration increases so much the responsiveness of the adrenal gland to ACTH at room temperature that such a response is not enhanced by exposure to cold. (Authors' abstract)

4086
Duke, H. N. 1953
PULMONARY VASOMOTOR RESPONSES TO CHANGES IN THE ALVEOLAR GAS CONCENTRATION. — In: Visceral circulation, p. 156-163. (Ciba Foundation Symposium). Ed. by G. E. W. Wolstenholme and others. Boston: Little, Brown and Co., 1953. DLC (QP101.C53)

The experiments reported here show that the pulmonary blood vessels respond to changes in the concentration of the normal constituents of the alveolar gas mixture. Pulmonary vasoconstriction occurs if either the CO_2 content is raised or the O_2 content is lowered in the alveolar air. It appears that changes in the O_2 tension of the alveolar air or perfusate are important in producing a

vasomotor response, and since the response can be altered by metabolic inhibitors such as iodoacetate, cyanide, or azide, it is possible that the most important factor may be an alteration of the metabolism in the vessel walls. So far as is known at present, the responses observed in the isolated lung are similar to those reported in the intact animal, so that the possibility is raised that they may play a part in regulating the pulmonary blood flow under normal or pathological conditions. (Author's summary and conclusions, modified)

4087
Duke, N., 1953
and E. Lanchbery
SOUND BARRIER. — x+117 p., 17 illus. London: Cassell and Company Ltd., 1953.
DLC (TL573.D78)

The development of high-speed flight is discussed to provide for the general, non-technical reader an understanding of the basic problems encountered in the design, engineering, and piloting of high-speed aircraft. An introductory survey of the phenomena of transonic and supersonic flight includes discussion of the nature of air pressure and airflow, Mach numbers, sound and shock waves, the sound barrier, and sonic "bangs". The development of jet propulsion is considered, and the present and future design of engines and aircraft is described in relation to problems of fuel storage, drag, compressibility effects, structural stresses, and lift at high altitudes. The physiological effects of acceleration, temperature, and rarefied atmosphere, and the development of equipment (anti-g and pressure suits, pressurized cabins, ejection devices) necessary to preserve at high altitude and high speed a tolerable physiological environment are discussed.

4088
Dunlap and Associates
PILOT PERFORMANCE WITH TWO DIFFERENT ATTITUDE DISPLAYS. — Dunlap and Associates, Stanford, Conn.; prepared for Douglas Aircraft Co., El Segundo, Calif. (Contract Nonr 1076(00)). July 21, 1955. ii+21 p. AD 82 868 UNCLASSIFIED

The effect of attitude displays — incorporating either a moving horizon (standard) or a moving airplane — on the flying performance of former (3 months to 10 years) pilots was studied in a C-11B jet simulator. Performance was consistently better when the moving airplane type display was used. Subjects personally favored the moving airplane display, and made fewer control reversals, required less time to recover from unusual attitudes, and were more precise in maintaining specified heading, altitude, and air-speed indications. It is suggested that the difficulty encountered by current pilots in transition to the moving airplane device may be eliminated through a brief period of recovery before training on the new display.

4089
Durante, U.
[CONSIDERATIONS ON SOME STATISTICAL DATA] Considerazioni su alcuni dati statistici. — Rivista di medicina aeronautica (Roma), 18 (4): 935-946. Oct.-Dec. 1955. In Italian, with English summary (p. 945). DLC (TL555.A1R5, v. 18)

A survey is presented of the documents from the Aeronautical Medico-Legal Institute, Naples, dealing with the causes of diseases or injuries that occurred in regular or war service during a nine-month period. Statistical data are included on the pathology of organs and organ systems, etiopathogenic aspects, clinical aspects, and medico-legal factors. (Author's summary, modified)

4090
Durante, U.
[NECESSITY OF PREVENTIVE AND PERIODIC VISITS IN THE PREVENTION OF AVIATION OCCUPATIONAL DISEASES IN SPECIALISTS OF THE MILITARY AIR FORCE] Necessità delle visite preventive e periodiche per la profilassi delle tecnopatie aeronautiche agli specialisti dell'aeronautica militare. — Rivista di medicina aeronautica (Roma), 18 (3): 719-731. July-Sept. 1955. In Italian, with English summary (p. 730).
DLC (TL555.A1R5, v. 18)

A general review is presented of the etiology and pathogenesis of broncho-pulmonary, dermatological, psychoneurotic, psycho-asthenic, hematological, oral, dental, and gastrointestinal disorders in air force specialists (electricians, mechanics, maintenance personnel) who contact various toxic substances daily. Included toxic substances are: carbon dioxide, carbon monoxide, nitric acid and related compounds, trichloroethylene, sulfuric acid and derivatives, methyl alcohol, methyl bromide, acetone, alcohols, gasoline, kerosene, carbon tetrachloride, engine oils, and turpentine. Mention is made of noise-induced deafness. The diagnosis and prevention of occupational diseases are discussed and it is stressed that a medical examination at the time of employment and periodically thereafter be required of personnel to insure both physical fitness and work efficiency.

4091
Durnin, J. V. G. A.,
and R. G. Edwards
MEASUREMENT OF PULMONARY VENTILATION AS AN INDEX OF ENERGY EXPENDITURE DURING FIELD SURVEYS [Abstract]. — Jour. Physiol. (London), 128 (3): 46P-47P. June 28, 1955.
DLC (QP1.J75, v. 128)

Analysis of data published in two surveys indicates that pulmonary ventilation may be used as an index of energy expenditure from a level of 15 liters/minute to above 50 liters/minute with a resulting error of only 10%.

4092
EARS CAN ASSIST EYES TO INCREASE OPERATORS' ABILITY: METHOD DEVELOPED FOR AIRCRAFT DECK LANDINGS. — Engineering (London), 179 (4651): 338. March 18, 1955. DLC (TA1.E55, v. 179)

Experimental studies are presented on the use of an audible induction system to convey information to the pilot which has hitherto been shown on visual indicators in aircraft. Its primary role is to lighten the pilot's task during aircraft deck landings. Known as Audio airspeed, the new system indicates to the pilot, through earphones, whether his speed is correct without interfering with voice reception from the earphones. Addition-

al uses of the Audio airspeed are in training, where a check can be made by instructors on the approach speeds of pupils, and in routine landings, where controlling officers can check on the airspeed of approaching aircraft.

4093
Ecker, P. G.,
and B. D. Polis
THE ACTION OF MESCALINE ON THE CEREBRAL METABOLISM OF THE RHESUS MONKEY AS DEFINED BY THE OXYGEN AND "GLUCOSE" UTILIZATION OF THE INTACT BRAIN. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5507, Aug. 18, 1955. v+17 p. (Project no. NM 001 103 300, Report no. 4). AD 75 308 UNCLASSIFIED

A study was made of the effects of mescaline, a drug known to produce visual and mental disturbances in man, on the metabolism of monkey brain in situ. The injection of 200 mg. mescaline produced an increase in cerebral blood flow averaging 113 percent over the flow under normal conditions. Neither cerebral oxygen consumption nor cerebral glucose utilization was significantly changed by the drug. However, using the difference between reducing substances found in blood filtrates made by zinc hydroxide and by perchloric acid as a measure of blood reducing substance other than glucose, the mescaline produced a significant increase in the brain metabolism of an unknown reducing component present in the monkey blood. In the monkeys injected with mescaline this amounted to 5 times that of the control series subjected to the experimental procedures alone. (Authors' abstract)

4094
Eckstrand, G. A.,
and R. L. Morgan
IMPROVEMENT IN THE TACTUAL DISCRIMINATION OF KNOB SHAPES WITH TRAINING AND PRACTICE [Abstract]. — Amer. Psychologist, 10 (8): 494. Aug. 1955. DLC (BF1.A55, v. 10)

Three groups of 20 subjects each were tested on a task which required tactual discrimination among four similar knob shapes. Prior to performing this task a Control Group was given no training, a Tactual-Name Group learned to associate "names" with the feel of the knobs, and the Tactual Group was given experience only at feeling the knobs. The Tactual-Name Group was significantly superior to the Control Group by both the time and errors criteria. The Tactual Group was superior to the Control Group in terms of the errors criterion only. All groups improved their performance significantly from the first half to the second half of the test trials and "same" discriminations were made significantly faster and with fewer errors than "different discriminations".

4095
Edelberg, R.
HYDROSTATIC EFFECTS OF COMBINED TUMBLING AND DECELERATION. — Office of the Secretary of Defense, Research and Development, Washington, D. C. Supplement to Shock and Vibration Bulletin, no. 22, p. 20-22; discussion p. 22-23. July 1955. DNLM

The effect of tumbling on the hydrostatic effects of strong deceleration was studied by rotation of anesthetized dogs at 60 to 210 r. p. m. during centrifugation at 10 g. Dogs exposed to combined accelerations for 5 seconds showed no damage, while dogs rotated at 180 r. p. m. without the superimposed g field or exposed to 10 negative g for 5 seconds without rotation showed symptoms of severe hemorrhage and engorgement in the head region. Measurements of blood pressure showed that the high blood pressure at the neck level during linear deceleration was increased by the addition of tumbling forces. The reduction in vascular damage during combined acceleration was therefore attributed to the brevity of time during which pressure waves were imposed on the peripheral blood vessels. The circulatory effects of tumbling (mass movement of blood out of the chest) were also reduced by the addition of a g field during tumbling.

4096
Edwards, H. K.
THE AGED AND RETIRED PILOT. — Jour. Aviation Med., 26 (1): 73-75. Feb. 1955.
DLC (RC1050.A36, v. 26)

A discussion is given by the medical director of Eastern Airlines, Inc., concerning the present general physical condition of a group of senior pilots (52 years and above) who were used for a similar evaluation in 1942. Of the original group of 40, twelve had, for various reasons, left active flying; only one had died an accidental death. Average figures for the group in the present examination and (in brackets) the examination 11 years ago were: weight, 170 (167.5) lb.; height, 69 1/4 (68 3/4) inches; standing pulse, 75 (77); blood pressure, 120/74 (112/74); and a Schneider index of plus 13 (12). The average number of solo flight hours at the time of the latest examination was 20,500 as compared with 12,250 hours in 1942. This remarkable physical record is attributed to the fact that these men were happy in their work; they wanted to fly, for when they entered the field, there was little monetary inducement. Also, these pilots realized that their job future depended upon their good physical health. The author stresses the importance of extending such physical care to the non-flying personnel, for it has been determined that these people are generally not in as good a physical condition as the pilots, yet many of them are key management individuals.

4097
Edwards, R. G.
AN ORO-NASAL MASK [ABSTRACT]. — Jour. Physiol. (London), 127 (3): 49P-50P. March 28, 1955
DLC (QP1. J75, v. 127)

An oro-nasal oxygen mask developed for use in field studies of energy expenditure is described. The mask fitted comfortably 95% of the adult male subjects tested, and was consistently preferred to conventional mouth-gag and nose-clip types.

4098
Egan, J. P.,
and E. J. Thwing
FURTHER STUDIES ON PERSTIMULATORY FATIGUE. — Jour. Acoust. Soc. Amer., 27 (6): 1225-1226. Nov. 1955. DLC (QC221. A4, v. 27)

Investigations of several methods for the measurement of auditory adaptation to a monaurally presented 1000-c.p.s. tone at 80 db. are described. The methods tested are (1) a simultaneous loudness balance between 1000 c.p.s. tones presented in each ear for a 15-second period; (2) a loudness balance between 1000-c.p.s. tones of 0.5-second duration presented alternately to each ear for 15 seconds, with or without the accompaniment of a clicking noise at the time of presentation of the tone; (3) simultaneous loudness balances with the adapting and comparison stimuli phase, 180° out of phase, or in random phase; (4) a loudness estimation of a single short tone presented once after the adapting tone was turned off; and (5) a simultaneous loudness determination by the localization method (determination of whether the tone was to the right or left of the medial plane of the head). Little apparent adaptation was recorded when procedures (2), (4), or (5) were used. Significant apparent adaptation was recorded by all other methods.

4099
Egan, J. P.
INDEPENDENCE OF THE MASKING AUDIOGRAM FROM THE PERSTIMULATORY FATIGUE OF AN AUDITORY STIMULUS. — Jour. Acoust. Soc. Amer., 27 (4): 737-740. July 1955.
DLC (QC221.A4, v. 27)

The effect of perstimulatory fatigue on the masking threshold was investigated by determining the threshold of a pure tone of 1000 c.p.s. masked by a uniform spectral noise of 100-5000 c.p.s. at 53.1 db. each minute during a 7-minute period of intermittent exposure to the same noise at a fatiguing level (90 db.). The masked threshold was found to be independent of the decreasing level of loudness of the fatiguing stimulus. Only slight differences in threshold were observed when a masked tone of 250 or 4000 c.p.s., or a masking pure tone of 1000 c.p.s. was utilized.

4100
Egan, J. P.,
F. R. Clarke, and E. C. Carterette
ON A THEORY OF THE TRANSMISSION AND CONFIRMATION OF MESSAGES IN NOISE. — Indiana Univ., Bloomington (Contract AF 18 (600)-571); issued by Air Force Cambridge Research Center, Bolling Air Force Base, Washington, D. C. Technical Report no. AFCRC-TN-55-67, Oct. 1, 1955. iii+49 p. AD 78 577

Theoretical considerations are presented which evolved from a series of experimental studies in which the restrictions imposed on the voice communication process by an articulation test were relaxed by increasing the number of events in a communication sequence. Probabilities for the occurrence of the possible types of communication event are presented. A theorem for a wide class of relations between the conditional probabilities of correct and incorrect confirmations is given which states that if each message in a set of messages is repeated until all are confirmed, the total number of incorrect confirmations will be larger under a relaxed criterion than under a more stringent one.

4101
Egan, J. P.
PERSTIMULATORY FATIGUE AS MEASURED BY HETEROPHONIC LOUDNESS BALANCES. — Jour. Acoust. Soc. Amer., 27 (1): 111-120. Jan. 1955. DLC (QC221.A4, v. 27)

An investigation was conducted to determine whether the process of localizing the sound image in a loudness-balance test was critical to the occurrence of perstimulatory fatigue. Perstimulatory fatigue was determined under two conditions: (1) the frequency of the comparison stimulus was the same as that of the fatiguing stimulus; (2) comparison and fatiguing stimuli differed sufficiently in frequency so that the listener always heard two pure tones which he could correctly localize in the two ears. The amount of perstimulatory fatigue was observed to be very nearly the same under the two conditions. A procedure was developed which eliminates the possibility of the formation of a single absolute standard of loudness simply by varying the intensity of the fatiguing stimulus from one loudness balance to another. The method results in greater measured fatigue than the usual procedure. (Quoted in part)

4102
Egdahl, R. H.,
D. H. Nelson, and D. M. Hume
ADRENAL CORTICAL FUNCTION IN HYPOTHERMIA. — Naval Medical Research Institute, Bethesda, Md. Research Report, Sept. 15, 1955. 12 p. (Project no. NM 007 081.22.03). AD 84 638
UNCLASSIFIED

Anesthetized dogs rendered hypothermic by cold-air exposure, arterial-venous shunt cooling, or immersion showed a progressive fall in the adrenal output of 17-hydroxycorticosteroids and in the level of circulating ACTH. The depression of adrenal activity persisted when ACTH was administered during or after cooling, when hypothermia was restricted to the adrenal glands, or when hemorrhage stress was imposed. Normal corticoid output was restored by rewarming. The depression in adrenal activity was thus demonstrated to be independent of the pituitary depression or other known body changes occurring during hypothermia.

4103
Egdahl, R. H.,
D. H. Nelson, and D. M. Hume
EFFECT OF HYPOTHERMIA ON 17-HYDROXY-CORTICOSTEROID SECRETION IN ADRENAL VENOUS BLOOD IN THE DOG. — Science (New York), 121 (3144): 506-507. April 1955.
DLC (Q1.S35, v. 121)

Analysis of samples of adrenal venous blood from hypothermic dogs showed a 75% decrease in adrenal venous blood minute corticoid output at body temperatures of 25-28° C. and a progressive decrease in adrenal venous blood flow. The decrease in corticoid output was unaffected by administration of ACTH or by maintenance of normal systemic blood pressure through infusion of norepinephrine. Application of local cold to the adrenal gland in normothermic dogs also caused a decrease in corticoid output, while cold exposure of the normothermic animal at -10° C. for periods up to 34 hours did not alter the normal adrenal response to ACTH. A direct adrenal suppression by hypothermia is suggested.

4104
Egmond, A. A. J. van, 1954
J. J. Groen, and G. de Wit
THE SELECTION OF MOTION SICKNESS-SUSCEP-

TIBLE INDIVIDUALS. — Internat. Record Med., 167 (12): 651-660. Dec. 1954.
DLC (R11.M745, v. 167)

Two methods of examination of the vestibular organ are described, cupulometry and parallel swing examination, which are useful in the selection of motion sickness-susceptible individuals. Specific motion sickness-prone persons show a steep cupulogram and an increased labyrinthine vasovegetative reflex, as can be observed by measuring the pressure in the central retinal artery. Other individuals (the nonspecific group) have either had a cerebral trauma (concussion) or have gone through a period of malnutrition.

4105
Eiff, A. W.
[THE BEHAVIOR OF SEVERAL BODY FUNCTIONS DURING A 7-DAY RHYTHM EXPERIMENT AND THE SIGNIFICANCE OF CONSCIOUSNESS OF TIME] Das Verhalten mehrerer Körperfunktionen während eines 7-tägigen Rhythmus-Versuches und die Bedeutung des Zeitbewusstseins. — Acta Medica scandinavica (Stockholm), Suppl. 307: 140-141. 1955. In German. DNLM

Two subjects were kept for seven days under constant light, noise, temperature, food, and rest conditions in a climatic chamber. Ten physiological indices were registered every three hours. On the fourth day the subject's time concept was distorted by nine hours through narcosis. The influence of time consciousness could be shown in the phase shifts of the 24-hour and 12-hour temperature rhythm with a two-hour delay. In both subjects the diurnal temperature curve exhibited 2 minima after the narcosis instead of one. The second minimum with a definite phase shift of 9 hours fell at the time of the previous maximum. There were individual differences in the adaptation of physiological rhythms to subjective time distortion.

4106
Eik-Nes, K.
ADRENOCORTICAL ACTIVITY AND METABOLISM OF 17-HYDROXYCORTICOSTEROIDS IN ANESTHETIZED DOGS EXPOSED TO COLD [Abstract]. — Federation Proceedings, 14 (1[I]): 336. March 1955.
DLC (QH301.F37, v. 14)

No increase in the 17-hydroxycorticosteroid level of the plasma was observed in unanesthetized dogs exposed to a temperature of 5° C. for 6 hours. Administration of ACTH to animals with a rectal temperature of 32° C. had no effect on the corticoid level. Intravenously administered cortisol was removed from the circulation at a reduced rate. Neither ACTH nor cortisol prevented a further fall in body temperature. It is suggested that both the production and metabolism of 17-hydroxycorticosteroids are reduced by hypothermia.

4107
EJECTION SEAT TRAINING. — U. S. Air Force Medical Service Digest, 6 (11): 19-20. Nov. 1955.
DLC

The ejection-seat trainer serves to familiarize the crew with cockpit bailout procedures and with the catapult ejection characteristics. The training program is conducted by physiological training officers. The indoctrination consists of lectures and discussions on the use of the ejection seat and the problems of escape. Before actual practice ejections the trainees are instructed in the proper posture and sequence of prefiring actions. They are allowed to proceed to complete ejection only after the instructor is satisfied with the trainee's efficiency in accomplishing the prefiring actions. At present there are two 90-foot ejection-seat towers and twelve 24-foot mobile ejection-seat trainers in use.

4108
Eldred, K. M.,
W. J. Gannon, and H. Von Gierke
CRITERIA FOR SHORT TIME EXPOSURE OF PERSONNEL TO HIGH INTENSITY JET AIRCRAFT NOISE. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-355, Sept. 1955. iv+25 p. (Project no. 7213). AD 84 553
UNCLASSIFIED

Criteria are presented which specify the maximum noise levels to which maintenance personnel servicing turbo-jet aircraft may be routinely exposed for durations ranging from several seconds to eight hours in any twenty-four hour period. Duration versus noise levels are given for cases of both the unprotected and protected ear. Examples are given which illustrate use of these criteria to define zones around aircraft in which personnel must wear ear plugs, ear muffs, or both protective devices in combination. (Authors' abstract)

4109
Eldredge, D. H.
THE EFFECTS OF BLAST PHENOMENA ON MAN: A CRITICAL REVIEW. — [Central Inst. for the Deaf, St. Louis, Mo.] (Contract Nonr-1151 (01)); issued by Armed Forces-National Research Council. Committee on Hearing and Bio-Acoustics, Washington, D. C. CHABA Report no. 3, June 1955. iii+24 p. (Project no. NR 140-069). AD 74 028
UNCLASSIFIED

A critical review has revealed that the open literature concerning the effects of blast on man is not extensive and is principally concerned with (1) injury to the ear; (2) body injuries severe enough to produce combat casualties; (2) cerebral blast concussion; and (4) battle fatigue or hysteric-anxiety state. An attempt is made to extract and organize the important studies and hypotheses encountered, and supplementary data are included from experience gained with high-intensity sound. A selected bibliography of 175 references, compiled by S. K. Hirsh, is included; it is mainly concerned with specific methods and techniques that have been used to measure possible impairment of function. (AD abstract, modified)

4110
ELEMENTARY FLYING TRAINING MANUAL AND INSTRUCTOR'S HANDBOOK. — Department of Transport (Canada). Air Services Branch, Ottawa. 1955. DLC (TL712.C32, 1955)

A complete guide and handbook is presented of elementary flying training for instructors and civil pilots. The following sequences of instruction are given special emphasis: familiarity with cockpit layout; preparation for flight; air experience; effect of controls; take-off, flying and landing techniques; pilot navigation; instrument flying; and night flying.

4111
Ellis, D. S.,
and W. Lesiw
MEASUREMENT OF SKILLS ON THE T1-A TRAINER. — Armament Systems Personnel Research Lab., Lowry Air Force Base, Colo. Technical Memorandum ASPRL TM-55-10, March 1955. 9 p. AD 65 652 UNCLASSIFIED

The following perceptual-motor tasks required of the A-5 fire control system operator are discussed: target selection, lock-on and firing. A group of 12 men, inexperienced on the lock-on task, were given 25 practice targets daily for 4 days on the T1-A. This group demonstrated as good accuracy in initiating manual search after the first day of practice as did a small group of experienced gunners. After the 4 days of practice, the previously inexperienced men had reduced their manual search time considerably, but had not yet attained the level of proficiency of the experienced gunners. Issues are considered which arise in obtaining and using scores for the component skills of the radar gunnery task. (AD abstract)

4112
Emerson, G. O.
AIRCRAFT PERISCOPES FOR PILOTAGE. — Jour. Aviation Med., 26 (2): 121-123. April 1955. DLC (RC1050.A36, v. 26)

Two types of aircraft periscopes are in use: one is a projection type in which the outside environment is projected on a screen which the pilot views; the other is an ocular periscope which permits direct observation of the outside surroundings, but requires that the aircraft instruments be projected into the field of view. The instrument described by the author is an ocular periscope which has a 75-degree field of vision, and a scanning mechanism permitting the field of a hemisphere to be searched. Distance estimation was found to be good by the twenty pilots who tested the periscope. When approaching the runway for landing, however, the relative velocity of ground objects seemed to increase rapidly; this caused some of the pilots to underestimate their distance from the ground. Using the projection type periscope, it has been discovered that they tended to overestimate their ground distance. The author blames instrument minification due to the one-power optical system used in both periscope types for an exaggerated sense of height and distance, and states that the slight haze which occurs in the projection type of instrument adds to this illusion.

4113
Eriksen, C. W.,
and H. W. Hake
ABSOLUTE JUDGMENTS AS A FUNCTION OF STIMULUS RANGE AND NUMBER OF STIMULUS AND RESPONSE CATEGORIES. — Jour. Exper. Psychol., 49 (5): 323-332. May 1955. DLC (BF1.J6, v. 49)

Same as the item no. 2712, vol. III.

4114
Eriksen, C. W.,
and H. W. Hake
MULTIDIMENSIONAL STIMULUS DIFFERENCES AND ACCURACY OF DISCRIMINATION. — Jour. Exper. Psychol., 50 (3): 153-159. Sept. 1955. DLC (BF1.J6, v. 50)

Essentially the same as item no. 2713, vol. III.

4115
Eriksen, C. W.
PARTITIONING AND SATURATION OF VISUAL DISPLAYS AND EFFICIENCY OF VISUAL SEARCH. — Jour. Applied Psychol., 39 (2): 73-77. April 1955. DLC (BF1.J55, v. 39)

The same as item no. 2714, vol. III.

4116
Ernsting, J.
THE BLOOD AND FLUID CONTENT OF THE LIMBS DURING HIGH PRESSURE BREATHING. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 926, July 1955. 23 p. AD 77 736 UNCLASSIFIED

The pressure-distension curves of the extremities were studied by segment plethysmography during high pressure breathing with trunk counter-pressure. A linear relationship was found to exist between the volume of blood pooled in the limbs and breathing pressure, as well as between filtration rate and breathing pressure up to pressures of about 100 mm. Hg. The filtration rate per unit volume and the distensibility of the vasculature were less in the lower limbs than in the upper limbs at the same breathing pressure. A reduction of the effective blood volume of 750 ml. was produced by pressure breathing at 50 mm. Hg for 11 minutes, at 100 mm. Hg for 3 minutes and at 135 mm. Hg for 1 minute. Vaso-vagal attacks were observed when the reduction in blood volume was between 650 and 900 ml. The study indicates that complete trunk counter-pressure will permit pressure breathing at 40 mm. Hg for 8 minutes or at 80 mm. Hg for 2 minutes without syncope, provided no emotion or painful stimuli are present and the environmental temperature is approximately 20° C. (Author's summary, modified)

4117
Ernsting, J.
THE TISSUE PRESSURES OF THE EXTREMITIES DURING HIGH PRESSURE BREATHING. — RAF Inst. of Aviation Medicine (Gt. Brit), Farnsborough; issued by Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 927, July 1955. 13 p. AD 68 263 UNCLASSIFIED

A slow and slight increase was observed in the pressure of subcutaneous tissues of the forearm and thigh, and in the limb muscles of normal subjects during high-pressure breathing with trunk

counterbalance. Pressures in the soleus and anterior tibial muscles were raised immediately by approximately 40% of the applied breathing pressure. These results are a reflection of the nature of fascia surrounding these tissues. In most regions of the unpressurized extremities the total increments in intravascular pressures produced by pressure breathing are exerted upon the walls of the vessels. The differences between the pressure distension curves for the upper and lower limbs are due to differences in the elastic characteristics of the limb vessels. (Author's summary, modified)

4118
Errebo-Knudsen, E. O., 1953
L. Hansen, and J. M. Vinter Hansen
[SPACE CONQUEST: ON THE POSSIBILITY OF TRAVEL IN SPACE] Verdensrummets erobring: vore muligheder for rejser i rummet. —— 79 p. København: Hans Reitzels Forlag, 1953. In Danish.
DLC (TL790.E7)

Several aspects of the problem of space travel are considered. Human space flight (p. 51-67) is reviewed under the headings: space medicine, physics of the atmosphere, the biological limits of space, means for investigation of atmospheres, and influences exerted on man in the space ship. Perspectives of the future (p. 68-79) describe research rockets and possibilities of extended space travel.

4119
Errebo-Knudsen, E. O.
[CO AND JET FLYING] CO and jetflyvning. —— Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (1): 20-22. 1955. In Danish.
DNLM

This is a report on measurements of the carbon monoxide content in the blood of ground personnel (22 subjects) working near running jet engines at the Karup air base. Of the 40 tests, 25 were negative; three showed 1%, eight 2%, three 3%, and one 5% COHb. A spectrophotometric method was employed in the analysis: 25 microliters of blood are sampled in 5 ml. 0.4% NH_3-water; the blood is hemolyzed from the ammonia water and analyzed by means of a Beckman photometer. The maximum error is ±3% (generally less); possible sources of error are indicated. Measurements of CO in jet pilots' blood as well as in the air of the cockpit have been negative.

4120
Errebo-Knudsen, E. O.
[THE FUTURE OF AVIATION MEDICINE] Flyvemedicinens fremtid. —— Militaerlaegen (København), 61 (2): 57-56. June 1955. In Danish. DNLM

Aeronautical advances expected in the next 50 years are envisioned. Besides the problems posed by high altitudes and the high speeds certain new problems will have to be dealt with in the conquest of space. One of the main problems which will become more and more important concerns the limitations of the human sensory organs and nervous system. The pilot will have to be relieved by turning over most of his functions to electronic or mechanical controls. The author discusses at some length the application of cybernetics to construction and design of such devices, and definition of the man-machine systems.

4121
Eschenbach, A. E.,
and E. F. Borgatta
TESTING BEHAVIOR HYPOTHESES WITH THE RORSCHACH: AN EXPLORATION IN VALIDATION. —— Jour. Consulting Psychol., 19 (4): 267-273. Aug. 1955. DLC (BF1.J575, v. 19)

This study explored the relation between 15 Rorschach scoring categories and 5 groups of behavioral descriptions selected as criterion variables in a sample of 125 Air Force enlisted personnel heterogeneous in regard to age, education, and military occupation. Forty-four behavioral hypotheses were examined on the basis of expected intercorrelation between Rorschach scoring categories with the multiple criteria. The ordering of relationships between the Rorschach variables and criteria was not dissimilar from chance expectation. Most of the relationships were of zero order except the ones involving intelligence.

4122
Eugster, J. 1952
[THE BIOLOGICAL EFFECT OF COSMIC RADIATION: METHODS AND NEW RESULTS] Die biologische Wirkung der kosmischen Strahlung: Methoden und neueste Ergebnisse. —— In: Probleme aus der astronautischen Grundlagenforschung [International Astronautical Congress, 3rd (Stuttgart, 1952), Proceedings], p. 211-218. Stuttgart, 1952. In German, with English summary (p. 211).
DLC (TL787.I44, 3rd. 1952)

The biological effects of cosmic radiation were investigated in Artemia salina eggs and live human and animal tissue preparations which had been carried by balloons to 28,000-30,000 m. altitude. Parallel control experiments were conducted at an underground station, shielded by rock, and on the earth's surface. It was shown that no charged particles penetrated to the underground control station; there was, however, considerable neutron radiation present. Direct hits by highly ionizing radiation components on eggs result in appearance of lethal factors. The hatching rate was 0% at 30,000 m. altitude, 96% on the earth's surface, and 9% in the underground station. A comparison of the effects of the heavy primary particles at altitude and at the control station led to the conclusion that the tolerance dose equals the balance of environmental radiation which the organism is expected to receive during its life time on the earth's surface. A method is described which traces the tracks of cosmic radiation in living tissue as well as their chemical effects on dyes and enzymes.

4123
Eugster, J. 1954
[ON THE RESEARCH TECHNIQUE FOR THE STUDY OF THE BIOLOGICAL EFFECT OF COSMIC RADIATION AT HIGH ALTITUDES] Zur Untersuchungstechnik der Erforschung der biologischen Wirkung der kosmischen Strahlung in grossen Höhen. —— In: Space-flight problems [International Astronautical Congress, 4th (Zurich, 1953), Proceedings], p. 203-205. Biel, 1954. In German.
DLC (TL787.I44, 4th, 1953)

Biologically highly active components of the cosmic radiation are discussed in respect to their physical structure and rate of occurrence at high altitudes. Specialized techniques are required for investigation of the biological and chemical activity of nuclear radiation in the strastosphere, whereby the selection of the media and temperature regulation is important. The apparatus and aggregates used for such high altitude flights are described in detail. The biological activity of cosmic radiation is twofold, since next to a direct hit, there is also indirect interference. Further studies are suggested of the influence of cosmic radiation on enzyme systems in living tissue, as radiation already in the smallest doses inhibits enzyme activity.

4124
Eugster, J.
[DEMONSTRATION OF PROOF OF COSMIC RADIATION IN THE HUMAN BODY] Demonstration über den Nachweis der kosmischen Strahlung im menschlichen Körper [Abstract]. —— In: Bericht über den V. Internationalen Astronautischen Kongress, Innsbruck, 5. bis 7. August 1954 [International Astronautical Congress, 5th (Innsbruck, 1954), Proceedings], p. 188-189. Wien, 1955. In German.
DLC (TL787.I44, 5th, 1954)

Preparations of living human tissue (skin) were exposed to cosmic radiation in the stratosphere and then regrafted on the living organism. Thus it was possible to observe changes in cell structure and anomalous cell development. This method allows histological observation of the effect of cosmic radiation particularly that of direct hits in the living tissue and precise estimation of the latency of possible damage.

4125
Eugster, J.
[THE PRESENT STATE OF BIOLOGICAL RESEARCH ON COSMIC RAYS] Der heutige Stand der biologischen Erforschung der kosmischen Strahlung (KS). —— Bulletin der Schweizerischen Akademie der medizinischen Wissenschaften (Basel), 11 (4-5): 314-318. Oct. 1955. In German, with English summary (p. 318). DNLM

Representative published works on the biological effects of cosmic rays are reviewed. The production by strong primary cosmic rays of mutations in germ cells and simple organisms, of skin burns in mice, and of tumors in humans is described.

4126
Eugster, J.
[COSMIC RAYS] Weltraumstrahlung. —— 141 p. Bern: Medizinischer Verlag Hans Huber, 1955. In German. DLC (QC485.E85)

The physical nature and biological effects of cosmic rays are discussed. Values for the occurrence of primary and secondary rays at altitudes from 31,000 m. above to 2,500 m. below the earth's surface are presented. Methods are discussed for the detection of the collision of cosmic rays with biological material by the simultaneous exposure of ionization-sensitive photographic plates (star tracking effect) or by the use of photographic and radiation-sensitive dyes or enzymes. Experiments conducted on Drosophila, Artemia salina, mice, plants, and human skin are considered. The known biological effects of cosmic rays are discussed, including the alteration of chromosomes, shortening of the life span, shortening of the latent time of hereditary mice tumors, and carcinoma. (435 references)

4127
Euler, U. S. von,
S. Hellner-Björkman, and I. Orwen
DIURNAL VARIATIONS IN THE EXCRETION OF FREE AND CONJUGATED NORADRENALINE AND ADRENALINE IN URINE FROM HEALTHY SUBJECTS. —— Acta physiologica scandinavica (Stockholm), 33 (Supplement 118): 10-16. 1955. In English). DNLM

Over a twenty-four-hour period the average urinary excretion of free noradrenaline in normal persons was 27 mg. and of adrenaline 4.3 mg. During the night hours, adrenaline excretion was 1.2 mg. per minute in comparison with 4.6 mg. per minute during the day hours. Similarly noradrenaline excretion was significantly lower at night (9.8 mg.) than during the day (23 mg.). Total urinary catechol amines (free and conjugated) showed approximately the same distribution as free catechol amines but were twice as high. (Authors' summary, modified)

4128
Euler, U. S. von,
R. Luft and T. Sundin
THE URINARY EXCRETION OF NORADRENALINE AND ADRENALINE IN HEALTHY SUBJECTS DURING RECUMBENCY AND STANDING. —— Acta physiologica scandinavica (Stockholm), 34 (2-3): 169-174. 1955. In English. DNLM

Normal persons placed on a tilting table at an angle of 75° for 3-4 hours showed a considerably increased urinary output of noradrenaline and adrenaline in comparison with corresponding excretion in the recumbent position. The increased production of noradrenaline is interpreted as the result of reflex activation of the vasomotor system induced by the orthostatic fall of the systolic blood pressure. Syncope did not occur in any of the tested subjects exhibiting an increase in noradrenaline excretion. (Authors' summary, modified)

4129
Evans, F. G.,
and H. R. Lissner
STUDIES ON PELVIC DEFORMATIONS AND FRACTURES. —— Anat. Record, 121 (2): 141-165. Feb. 1955. DNLM

Stresscoat deformation studies of the intact pelvis (from adult cadavers) under dynamic loading of the ischial tuberosities, such as occurs in emergency escape from an airplane, revealed that it behaved like an elastic body, whose deformation could be demonstrated with as little as 33 inch-pounds of energy. Various tensile strain patterns were produced by lateral displacement of the acetabula, medial or lateral rotation of the anterior superior iliac spine, medial or lateral rotation of the ischial tuberosities or combinations of these movements. Studies were also made of the strains produced by impact loading of the pelvis of the almost intact

body and the mechanism of pelvic fractures by static and dynamic loading of the pelvis outside of and within the body. Included are 22 figures.

4130
Evans, W. E.
A STUDY OF INTELLIGIBILITY AND SELECTIVE FILTERING WITH A UNIDIRECTIONAL COMMUNICATIONS NET. — Ohio State Univ. Research Foundation (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no.62, Dec. 15, 1955. iii+15 p. UNCLASSIFIED

Seventy-five male college students served as subjects in 25 teams of three individuals per team. Each team manned a station in a unidirectional communications network. Criterion scores of per cent intelligibility (Stations one and two) and total word reception (Stations two and three) were obtained using multiple-choice intelligibility tests. Various portions of the test were filtered into five different frequency band widths. The selected filtering conditions acted upon the multiple-choice verbal material in a manner comparable to other types of speech tests, differentially affecting the magnitude of information loss usually found when a message is relayed. There was no evidence found for a decrement in total number of words transmitted per unit time due to selective filtering or retransmission. (Author's abstract)

4131
Evrard, E.
[AERONAUTICAL ASPECTS OF SOME PATHOLOGICAL CONDITIONS IN FLYING PERSONNEL (GASTRO-DUODENAL ULCER--PULMONARY TUBERCULOSIS)] Aspects aéronautiques de quelques états pathologiques chez le personnel navigant (ulcère gastro-duodenal—tuberculose pulmonaire). — Médecine aéronautique (Paris), 10 (4): 377-405. 1955. In French. DLC (TL555.M394, v. 10)

The occurrence of gastro-duodenal ulcer and pulmonary tuberculosis in aviation personnel is discussed. No significant difference in rate of occurrence of ulcers is found between military and civilian populations or between flying and ground personnel in the study of selected statistics from Belgium, France, and the U. S. The treatment and return of victims of ulcer to flying service, and legal implications of the disease are considered. No causal relation has been determined between flying and tuberculosis, which is less frequently seen among flying personnel than among other groups in the population, although caution is urged in returning the patients to flying.

4132
Evrard, E.
[THE "HEAT BARRIER": AEROMEDICAL ASPECTS] La "barrière de la chaleur": aspects aéro-medicaux — Force aérienne Service de santé bulletin technique d'information (Bruxelles), 2 (3): 34-40. Aug. 1955. DNLM

Physical aspects of the problem of heat in high-speed aircraft and spacecraft are discussed, including the production of heat by friction, the conductive exchange of heat between aircraft and the environment and the radiative exchange of heat in spacecraft. Methods of biological temperature control are described, including refrigeration and the ventilated flying suit.

4133
Evrard, E.
[SURVIVAL OF THE AVIATOR IN A HOSTILE ENVIRONMENT: MEDICAL ASPECTS: STUDIES INTENDED FOR FLYING PERSONNEL AND FOR INSTRUCTORS OF PHYSICAL EDUCATION] Survivance de l'aviateur en milieu hostile: aspects médicaux; leçons destinées au personnel navigant et aux instructeurs d'éducation physique. — [Bruxelles], 1955. Ex. no. 49. 65 p. In French. DNLM

Topics considered in a general discussion of problems basic to survival in a hostile enviromnent enclude: (1) the nature of nutritional substances, including proteins, fats, carbohydrates, minerals, and vitamins, their role as constituents of a normal diet, and the physiology of hunger, thirst, and malnutrition; (2) the thermo-regulatory mechanism of the body and means of protection against environmental conditions of heat and cold; (3) regulation of behavior (hygiene, rest, water, nourishment) in a hostile environment; (4) measures of protection in the desert, in the jungle, in the Arctic, and on the ocean; (5) common tropical diseases, including malaria and dysentery; (6) first aid; and (7) composition of the survival kit used in the Belgian Air Force.

4134
Evrard, E.
[TESTS OF DEPTH PERCEPTION, SELECTION OF AVIATORS, AND APTITUDE FOR FLYING] Tests de perception des distances, sélection des aviateurs et aptitude au vol. — Médecine aéronautique (Paris, 10 (1): 7-20. 1955. In French. DLC (TL555.M394, v. 10)

A total of 1,054 student pilots of the Belgian Air Force were examined to measure the threshold of relative depth perception at 6 meters in order to determine the role of the binocular factors in depth perception of flying ability. The results were compared with the success of the subjects in earning their pilot's rating. Little correlation was found between pilot success and stereoscopic acuity, the number of eliminations being nearly equal to the number of successes among all degrees of acuity. Among subjects with a stereoscopic acuity of 0-60 seconds, 49.4% were eliminated; of 61-200 seconds, 56.8%; and of 151-200 seconds 63.1% were eliminated. The contribution of good binocular depth perception towards the training of pilots (who must eventually rely chiefly on monocular factors in depth perception) is not discounted. It is suggested, however, that other factors may be utilized to compensate for weakness in this area, thus enabling many of the students with inferior binocular depth perception to become pilots.

4135
Exton, W.
SEAT FOR HIGH SPEED CONVEYANCE. — U. S. Patent 2,712,849. July 12, 1955. 3 leaves. DP

A forward-facing seat for high speed vehicles is described which is constructed to provide maximum support to the body during severe deceleration and impact by automatic reversal to a position facing opposite the direction of applied inertial force.

4136
F-86 INCIDENT. — Air Defense Command Surgeon's Bulletin, 2 (3): 15-17. Aug. 1955. DNLM

The medical case report is presented of an F-86 pilot who was rescued in an apparently hypothermic state after immersion in water at a temperature of 34° F. for a minimum of 45 minutes. The pilot was returned after minimal treatment to flying duty one week after the incident.

4137
Fabre, H.,
and L. Legendre
[OXYGEN DESATURATION OF THE BLOOD AND THE MECHANISMS OF RESPIRATORY RECOVERY AFTER VOLUNTARY APNEA WITH OR WITHOUT EFFORT] La désaturation du sang en oxygène et les mécanismes de la reprise respiratoire après apnée volontaire avec ou sans effort. — Journal de physiologie (Paris), 47 (1): 173-176. 1955. In French. DLC (QP1.57, v. 47)

Measurements were made of the oxygen desaturation of blood at the moment of spontaneous recovery from voluntary apnea accomplished with or without effort and preceded by hyperventilation, forced inspiration, or normal respiration. Desaturation was found to be less when apnea was forced. The Flack test is therefore considered not to be a test of anoxemia. Since great variability in oxygen desaturation was seen between individuals and types of respiration preceding apnea, it is concluded that either the oxygen saturation of the blood is not the essential factor in respiratory recovery, or the variations are due to individual variations in the sensitivity of the respiratory nerve centers.

4138
Fabricant, N. D.
MOTION SICKNESS. — Eye Ear Nose and Throat Monthly, 34 (4): 254-255. April 1955. DNLM

A brief review is given of motion-sickness drugs with central nervous system activity (barbiturate or bromide preparations, synthetic antispasmodics, antihistaminics). Drugs found to be effective in the prevention of motion sickness are listed together with their single average dose.

4139
Fábry, P.
[THE EFFECT OF FOOD COMPOSITION ON THE DAILY RHYTHMIC VARIATIONS IN CARBOHYDRATE RESERVE] Vliîanie sostava pishchi na sutochnoe ritmicheskoe kolebanie uglevodnykh rezervov. — Physiologia bohemoslovenica (Praha), 4 (2): 145-151. 1955. In Russian, with German summary (p. 151). DLC (QP1.C417, v. 4)

The diurnal variations in the carbohydrate reserve utilization as influenced by the food composition was studied in rats. In accordance with previously reported results, a rhythmic variation of the liver glycogen content is observed 6-8 hours after feeding in rats on a normal mixed diet. The blood sugar curve follows approximately parallel course to that of liver glycogen content. In animals on a carbohydrate-free diet, the liver glycogen rhythm changes, the peak increase appearing only 14-16 hours after increased food ingestion. The blood sugar response deviated considerably from that of animals on a normal diet; at feeding time the blood sugar is on the decline, while the peak appears at the time of the maximal physiological hunger and of a low liver glycogen level. The possible interpretation of these results is discussed.

4140
Falconnet, P.,
and J. Alavoine
[COMPARATIVE STUDY OF SHORT-DURATION AND CHRONIC DEAFNESS CAUSED BY INTENSE NOISE] Étude comparée de l'assourdissement de courte durée et de la surdité chronique par bruits intenses. — Médecine aéronautique (Paris), 10 (4): 357-361. 1955. In French. DLC (TL555.M394, v. 10)

An experiment was conducted to determine the validity of the use of temporary noise-induced deafness as a measure of susceptibility to chronic induced deafness. Normal subjects not previously exposed to traumatic noise were exposed for 3 minutes to a complex spectrum of 100-9000 c.p.s. at 100 db. The degree of deafness at 3000 c.p.s. and time required for recovery were measured. In 78% of the subjects the auditory threshold was lowered 4-14 db. at 3000 c.p.s., 15% showed a greater lowering, while 7% showed no change. 72% of the subjects recuperated in 1-4 minutes, 7% immediately, and 19% in 5-15 minutes. Results of tests conducted on 10 airmen exhibiting no signs of deafness after 7,000 hours of flight, and on 7 subjects with early symptoms of deafness, showed a similar distribution. Although no indication of susceptibility to deafness can therefore be derived from from the test in its present form, it is suggested that longer exposure to the test conditions might produce meaningful results.

4141
Fasola, A. F.,
R. C. Baker, and F. A. Hitchcock
ANATOMICAL AND PHYSIOLOGICAL EFFECTS OF RAPID DECELERATION. — Ohio State Univ. Research Foundation, Columbus (Contract AF 33 (038)-19727); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-218, Aug. 1955. vii+101 p. (Project no. 7219, Task no. 71723). AD 92 025 UNCLASSIFIED

This investigation was undertaken in response to the request of safety engineers who are in need of information concerning the strength of the human skeleton and the effects of rapid deceleration produced by safety devices. There are many approaches to the subject of tolerance of the human body and protective devices against high-peak decelerative forces. This report contains several aspects of the various approaches to this problem. The three-fold objectives are as follows: (1) To provide information concerning the strength of the pelvic walls, inclusive of the acetabula and femurs. (2) Through the use of highspeed X-ray, to describe a possible mechanism for the production of cardiac failure. And (3) to measure the tolerance of dogs to rapid deceleration and to provide information which would contribute to the solution of the problem concerning the possible danger resulting from the use of abdominal safety belts in rapid deceleration. (152 references)

4142
Fenn, W. O.
[A REVIEW ON RECENT WORK IN THE FIELD OF RESPIRATION AS APPLIED TO VOLUNTARY PRESSURE BREATHING] Una rassegna sui lavori eseguiti di recente nel campo della respirazione, applicati alla respirazione a pressione volontaria. — Rivista di medicina aeronautica (Roma), 18 (1): 3-22. Jan.-March 1955. In Italian, with English summary (p. 20-21). DLC (TL555.A1R5, v. 18)

A discussion is presented on the physiological mechanism of voluntary pressure breathing with special reference to the basic concepts represented by the thoracic pressure-volume diagram and the alveolar CO_2-O_2 diagram. On the basis of these concepts changes in breathing can be quantitatively demonstrated and consequently the advantages of pressure breathing and voluntary hyperventilation. Mention is made of pressure breathing by pilots subjected to emergency conditions at high altitude.

4143
Ferguson, J. R.,
and G. W. Frimpter
EJECTION SEAT ESCAPE. — Tactical Air Command Surgeon's Bulletin, 5 (4): 1-3. April 1955. DNLM

The following procedures are suggested on the basis of an experience in ejection escape from a jet fighter at 31,000 feet: (1) required use of a parachute equipped with a barometric time-delay opener, (2) development of a helmet and oxygen mask which will remain secure during high-speed bailout, (3) thorough training of airmen in bailout procedure at low and high altitudes, and (4) routine use of personal equipment suitable to the outside environment at the flying altitude and on the ground.

4144
Ferrari, E.,
and L. Amantea
[ASPECTS OF CEREBRAL CORTICAL ELECTRICAL ACTIVITY OF DOGS SUBJECTED TO INDUCED HYPOTHERMIA. II. BIOELECTRICAL CHARACTERISTICS OF CONVULSIVE ACTIVITY] Aspetti della attività elettrica della cortica cerebrale di cane sottoposti ad ipotermia provocata. II. Le caratteristiche bioelettriche dell'attività convulsiva. — Bolletino della Società italiana di biologia sperimentale (Napoli), 31 (1-2): 22-24. Jan.-Feb. 1955. In Italian. DNLM

Convulsive activity, both of the petit mal and grand mal types, was electroencephalographically recorded in curarized, hyperoxygenated dogs exposed to cold and maintaining a rectal temperature of 22°-34° C. Convulsive recordings were synchronous and identical in all cerebrocortical areas and displayed the so-called recruitment response. Duration of the epileptic manifestitation was noted to be variable and totally dependent on the degree of oxygenation. It is suggested that convulsive activity has a central brain genesis.

4145
Ferrari, E.,
and L. Amantea
CONVULSIVE ELECTROCORTICAL DISCHARGES IN HYPOTHERMIC DOG [Abstract]. — Electroencephalography and Clinical Neurophysiol. (Montreal), 7 (3): 441. Aug. 1955. DNLM

The patterns of convulsive electrical discharges are described, as observed during corticographic recordings of hypothermic dogs with anal temperatures between 34° and 22° C. The genesis of convulsive seizures in the hypothermic dog is presumed to be centrencephalic. The electrographic patterns contribute to document the connections existing between "grand mal" pattern, "petit mal" pattern, and "recruited responses".

4146
Fiedler, F. E.
THE INFLUENCE OF LEADER-KEYMAN RELATIONS ON COMBAT CREW EFFECTIVENESS. — Jour. Abnormal and Social Psychol., 51 (2): 227-235. Sept. 1955. DNLM

Two studies were conducted to explore the relation between the leader's interpersonal attitudes and the effectiveness of military combat crews. Two types of leader attitudes, interpersonal perception measured by Assumed Similarity test (ASo) and sociometric preference for the keyworker of the crew, were correlated with certain criteria of crew effectiveness. The first study of 70 B-29 bomber crews yielded a negative correlation between leader' s ASo scores and crew effectiveness for groups (a) in which the accepted leader sociometrically endorses the keyman, and (b) in which the leader and the keyman mutually choose each other. There was an interaction effect between the leader's generalized attitude toward co-workers and his specific attitude toward the keyman. A validation study conducted with 25 tank crews supported the above findings, corroborating the evidence that effective group leaders tend to have an inverse relationship between their ASo scores and sociometric preference which gives an optimum psychologic distance for the interaction between the leader, the keyman and the crew.

4147
Fields, G. C.,
and T. H. Reddington
OXYGEN REGULATING SYSTEM. — Johnson Fare Box Company, Chicago, Ill. U. S. Patent 2,685,288. Aug. 3, 1954. 5 leaves. DP

A pressure-compensating oxygen regulator for high-altitude flying is described and illustrated. It is a system capable of feeding varying amounts of oxygen and air to the wearer of an oxygen mask, the amount of oxygen increasing as altitude increases, until at a predetermined altitude pure oxygen is supplied. At a different predetermined altitude, oxygen is maintained at a positive pressure in the mask. This system is automatic, conserves the oxygen supply, supplies oxygen in accordance with aeromedical standards, and is adequate for conditions of sea level to over 50,000 feet of altitude.

4148
Findlay, J. D.
THE RESPIRATORY BEHAVIOUR OF CALVES EXPOSED TO INCREASING THERMAL STRESS [Abstract]. — Jour. Physiol. (London), 130 (3): 16P-17P. Dec. 29, 1955. DLC (QP1.J75, v. 130)

Calves exposed to increasing environmental temperatures of 20-40° C. responded with an increase of respiration frequencies (from 34 to 180 respirations per minute) and ventilation rates (from 30 to 80 liters per minute) and a decrease of tidal volumes (from about 800 to 480 milliliters). The increase in respiration frequency and ventilation rate was more pronounced in those animals whose rectal temperatures had risen to higher values.

4149
Fisher, A. C.
AVIATION MEDICINE ON THE THRESHOLD OF SPACE: SERVICE DOCTORS, FACING MEDICAL PROBLEMS UNKNOWN ON EARTH, MAKE POSSIBLE MAN'S EXPLORATION OF THE HOSTILE HEAVENS. — National Geogr. Mag., 108 (2): 241-278. Aug. 1955. DLC (Gl.N27, v. 108)

A review is presented of the projects dealing with the medical problems of high altitude flight which are in progress at various aeromedical research centers in the United States. Among the projects are those concerned chiefly with: (1) the effect of cosmic rays on the body; (2) the hazards of strong centrifugal forces and very high intensity noise; (3) ejection from aircraft; (4) hypoxia and hyperventilation; (5) design of oxygen equipment and pressure suits, and (6) the phenomenon of weightlessness. Many photographs are also included.

4150
Fishman, A. P.,
A. Himmelstein, H. W. Fritts, and A. Cournand
BLOOD FLOW THROUGH EACH LUNG IN MAN DURING UNILATERAL HYPOXIA. — Jour. Clinical Investigation, 34 (4): 637-646. April 1955. DLC (R11.J67, v. 34)

During unilateral breathing of hypoxic gas mixtures capable of increasing pulmonary arterial pressure when applied to both lungs, no alteration in either total minute blood flow, or in the distribution of blood flow to each lung was observed. It is therefore concluded that the hypoxic stimulus does not act directly upon either the lung or the post-arteriolar segments of the pulmonary vascular tree to increase pulmonary vascular resistance to blood flow. A discussion is presented on the physiological factors responsible for the difference in oxygen uptake by both lungs despite the maintenance of pulmonary blood flow during unilateral hypoxia. (Authors' summary, modified)

4151
FIT TO FLY. — Flying Safety, 11 (1): 24-26. Jan. 1955. DLC (UG633.F43, v. 11)

This is a popular review of the effects of natural stresses of flight (hypoxia, carbon monoxide, noise, etc.) and self-induced stresses (inadequate rest, colds, alcohol, emotional upsets, acceleration, etc.) on pilot performance in flight.

4152
Fitts, P. M.,
and R. Schneider
REPRODUCTION OF SIMPLE MOVEMENTS AS A FUNCTION OF FACTORS INFLUENCING PROPRIOCEPTIVE FEEDBACK. — Jour. Exper. Psychol., 49 (6): 445-454. June 1955. DLC (BF1.J6, v. 49)

This study tested the hypotheses that elasticity added to a control should lead to improved spatial accuracy of movements, while damping and mass added to a control should lead to improved temporal accuracy of movement. To test these hypotheses subjects performed simple circular and triangular control motions with a joy stick when the control was loaded with various degrees of spring stiffness, or damping, or mass. Three levels of each control parameter were equated originally by means of a psychophysical procedure so that movements opposed by each of the three physical factors were judged by subjects to involve equal effort. Increase in damping and mass resulted in reduction of temporal variability in support of the proposed hypothesis regarding the utilization of proprioceptive information. Increasing the degree of spring stiffness did not significantly improve spatial accuracy of movement. (Authors' summary, modified)

4153
Fitts, P. M.
STIMULUS DETERMINANTS OF SPEED IN CLASSIFYING VISUAL PATTERNS. — In: Office of Naval Research, Symposium on physiological psychology, p. 102-116. ONR Symposium Report ACR-1, March 10-11,1955. AD 80 100 UNCLASSIFIED

This is a review of experiments on two kinds of stimulus variables that influence the perception of a particular visual form, namely other figures in the field of view, and other similar figures not immediately present or experienced. The variables investigated with respect to recognition time included (1) the level of stimulus complexity, (2) the degree of redundancy in the figure, and (3) orientation of the figure. Increase of redundancy of the figure in presence of visual background noise contributed to more efficient recognition up to a point, above which there was a loss in efficiency of recognition due to a decrease in detail size.

4154
Flandrois, R.
[RORSCHACH AND ACCIDENT PRONENESS] Rorschach et prédisposition aux accidents. — Médecine aéronautique (Paris), 10 (2): 149-153. 1955. In French. DLC (TL555.M394, v. 10)

Rorschach tests were administered to average pilots and to pilots involved in aerial accidents to determine whether accident proneness could be identified from results of the test. It was found that pilots involved in accidents did not differ significantly in the number of whole, white area, space animal movement, and shading and color responses. The number of rare-detail responses was increased, while the number of human movement responses was decreased. Content evaluation disclosed no significant differences between the group of pilots involved in accidents and the control group of pilots without accidents.

4155
FLAT TV TUBES FOR INSTRUMENT FLYING. — Off. Naval Research, Research Rev., 1955 (Feb.): 13-15. DLC (Q180.U5A54, v. 1955)

The development of a flat, transparent television tube is expected to result in an instrument panel consisting of only two basic instruments for display of all flight information. One television tube mounted vertically in front of the pilot will display altitude, attitude, and speed information under instrument flying conditions without interfering with normal vision during contact flight. A second tube mounted horizontally will present all other flight information.

4156
Fleishman, E. A.
A COMPARATIVE STUDY OF APTITUDE PATTERNS IN UNSKILLED AND SKILLED PSYCHOMOTOR PERFORMANCES [Abstract]. — Amer. Psychologist, 10 (8): 497. Aug. 1955. DLC (BF1.A55, v. 10)

The subjects, a total of 200 basic airmen, received extended practice on seven experimental psychomotor tests and in addition received a battery of printed and apparatus reference tests. Two

comparison factor analyses were carried out on the intercorrelations among four stages of practice on one of the psychomotor tasks, the Complex Coordination test, and fourteen other psychomotor and printed tests. Both analyses were identical, except one used the scores obtained on the six of the psychomotor tests at early stages of proficiency, while the other used the scores obtained at late stages of proficiency. The same eight factors were identified by the reference tests in each analysis. However, the factor patterns for the six psychomotor tests were quite different when the late stage scores were substituted for the early stage scores. It is concluded that aptitude patterns contributing variance in skilled performances differ in the degree of involvement of the same factors which contribute at the earlier proficiency levels.

4157
Fleishman, E. A.
PREDICTING CODE PROFICIENCY OF RADIO-TELEGRAPHERS BY MEANS OF AURAL TESTS. — Jour. Applied Psychol., 39 (3): 150-155. June 1955. DLC (BF1.J55, v. 39)

A preliminary study is described which was designed to evaluate the utility of certain auditory-perceptual tests for prediction of radio operator success in training. The criterion of success was speed of code reception at the end of the fourteenth week of training. The best single predictor turned out to be the Army Radio Code Test. Code Distraction, Dot Perception, and Rhythm Discrimination tests yielded approximately equal or better individual predictions than the Signal Corps Code Aptitude Test. A combination of the Army Radio Code, Rhythm Discrimination, and Code Distraction tests yielded a multiple correlation with the criterion of .513 which for practical purposes was comparable to that achieved by the total battery. The results also suggest that aural tests are likely to achieve a degree of prediction of later code proficiency not possible by printed tests alone. (Author's summary, modified)

4158
Fleishman, E. A.,
and W. E. Hempel
THE RELATION BETWEEN ABILITIES AND IMPROVEMENT WITH PRACTICE IN A VISUAL DISCRIMINATION REACTION TASK. — Jour. Exper. Psychol., 49 (5): 301-312. May 1955. DLC (BF1.J6, v. 49)

A psychomotor practice task together with a number of reference tests was administered. A factor analysis of scores obtained at different stages of proficiency on the practice task together with scores on the reference tests was carried out. The results confirmed earlier findings with a different psychomotor practice task that considerable but systematic changes in factor structure occur as a function of practice. However, in contrast to the previous study, the present task did not become progressively less complex (in terms of the number of factors measured) as practice was continued. As before, there was an increase in the contribution of a factor common only to the practice task, but this increase was not as marked as with the previous task. (Authors' summary)

4159
Flickinger, D.
CREW EFFECTIVENESS IN THE B-52 STRATEGIC BOMBER. I. PLANNING BY HUMAN FACTORS TEAMS. — Jour. Aviation Med., 26 (1): 2-12. Feb. 1955. DLC (RC1050.A36, v. 26)

A discussion is presented concerning the activities and findings of a B-52 human factors team which consists of a biophysicist, a psychologist, a physiologist, an anthropologist, and a flight surgeon. The development of the human factors team resulted from the apparent need for planning a weapons system, such as the B-52 bomber, around the men who must fly the ship. The most important phase of the work of the team was the premockup inspection and evaluation of crew competence. In planning the B-52 weapons system, some of the problems encountered and overcome by human factors research were: installation of a warning light at each crew position to indicate emergency escape when it was discovered that a bell could not be heard in a pressure helmet; installation of a central control panel between the pilot and the co-pilot to allow for emergency takeover should either be rendered a casualty; provision of handholds in the walkways and elimination of sharp corners to facilitate passage of the crew members; repositioning of the tail gunner's mount and radar scope as well as the radar controls to permit greater facility of operation.

4160
FLIGHT SIMULATOR REVEALS ERRORS MADE USING "RMI". — Skyways, 14 (11): 32-33. Nov 1955. DLC (TL501.S634, v. 14)

Essentially the same as item 4053.

4161
THE FLIGHT SURGEON PHYSIOLOGICAL TRAINING OFFICER RELATIONSHIP. — U. S. Air Force Medical Service Digest, 6 (11): 12-14. Nov. 1955. DLC

The differential duties of the flight surgeon and the physiological training officer are outlined for lectures and demonstration of equipment, supervision of simulated flights, ejection-seat training, night-vision training, physical fitness determination for altitude-chamber flights and ejection-seat trainer rides, observation of chamber flights at different altitudes, arranging of low-pressure chamber flights for medical evaluation of flying personnel, participation at flying safety meetings and on the accident investigation board.

4162
Flottes, L.,
R. Guillerm, and Badre
[SINUS BAROTRAUMAS] Les barotraumatismes des sinus. — Revue de médecine navale (Paris), 10 (1): 21-27. In French. DNLM

Incidence, anatomo-pathological aspects, etiology and pathogenesis, clinical aspects, diagnosis, and treatment of aerosinusitis are discussed. During selection, the flight surgeon's role in preventing aerosinusitis is stressed. He is responsible for referring flight candidates with respiratory insufficiency to an otorhinolaryngologist, subjecting all candidates to a decompression chamber test and referring those subjects presenting sinus pain to an otorhinolaryngologist, and providing sinus X-ray for subjects giving a history of sinus disorder.

4163
Flottes, L.,
and R. Guillerm
[THE STANDARDIZATION OF OTO-RHINO-LARYN-

GOLOGICAL TESTS OF APTITUDE FOR FLIGHT AND SUBMARINE DUTY] La codification des épreuves O.R.L. d'aptitude à la navigation aérienne et sous-marine. — Revue de médecine navale (Paris), 10 (2): 157-165. 1955. In French. DNLM

A critical study is presented of different oto-rhino-laryngological tests (rhinoscopy, X-rays, audiometry, etc.) used in the screening of flight candidates who may be susceptible to aerotitis, aeroembolism, and deafness. The roles of both base physician and otorhinolaryngologist during the testing period, are outlined and the importance is stressed of their cooperation in the selection of candidates.

4164
Flückinger, E.,
and F. Vezár
LACK OF ADAPTATION TO LOW OXYGEN PRESSURE IN AGED ANIMALS. — Jour. Gerontol., 10 (3): 306-311. July 1955. DNLM

Adaptation to low atmospheric pressure of 350 mm. Hg was studied in 64 male rats between the ages of 45 to 570 days (2-20 months). Adaptation was tested by the decrease and restoration of body temperature during 15 days' continuous exposure to low atmospheric temperature. Retained adaptation was also tested after an additional study of 40 hours at normal barometric pressure (732 mm. Hg at Basel). 14-20 month old rats were completely unable to restore the normal body temperature after the initial drop during the first few hours of exposure to low barometric pressure. They also showed a decreased retained adaptation. This is in contrast to the findings in younger animals. There was no significant difference in the increase of blood hemoglobin between young and old rats in response to a ten to fifteen day exposure to 350 mm. Hg. (From the authors' summary)

4165
[ACTIVITIES OF THE AVIATION AND NAVAL MEDICINE COMMISSION DURING 1954] Flyg och navalmedicinska nämndens verksamhet under år 1954. — Meddelanden från flyg-och navalmedicinska nämnden (Stockholm), 4 (2): 1-6. 1955. In Swedish. DNLM

This article summarizes research (mainly in physiology) and the extent of advisory services, instruction, and training carried out by the various divisions of the Commission; and lists leading personnel, also works, reports, etc., published during 1954. Work was continued on equipping the laboratories at the Karolinska Institutet; preliminary tests were made of the centrifuge and the pressure chamber. The work on the diving equipment and the equipment for high-altitude flying was accelerated. A number of lectures (listed) were delivered at conferences and specially arranged instruction courses.

4166
Flynn, V. P.
THE AGING PILOT. — Flying, 56 (3): 22, 59. March 1955. DLC (TL501.P6, v. 56)

The relation of a pilot's age to his efficiency in flying is briefly discussed. Chronological age does not necessarily determine physiological age, and only a physician can decide whether the rate of declining physiological and mental activity is normal with a particular pilot's age. Flying becomes dangerous when the pilot's physical deterioration balances his experience.

4167
Fokkema, S. D.
[PSYCHOLOGICAL CONSIDERATIONS ON THE FLIGHT TRAINING AND ON THE RESEARCH ABOUT PROFICIENCY OF FLIERS] Psychologische beschouwingen over het leren vliegen en over het onderzoek naar de geschiktheid als vlieger. — (Doctoral dissertation, Vrije Univ., Amsterdam) Groningen: J. B. Wolters, 1954. 296+[9] p. In Dutch, with English summary (p. 278-284). DLC (TL712.F6)

The motivation of the aviation cadet as well as the dynamics of flight training are analyzed within the framework of the Lewinian field theory. In the Netherlands, the procedure of pilot selection was broadened by inclusion of the Sensorimotor Apparatus III, (S.M.A. III) coordination-apparatus tests, a group Rorschach test, and several paper and pencil tests. This battery was administered to a group of 201 applicants, of which 67 men were rejected; 67 men were admitted but failed the flight training within 20 hours, and 67 men passed the first phase of flight training. The predictive power of different subtests was compared. Although the S.M.A. III is of moderate validity, its use was justified by the low intercorrelations with other tests. Quantitative evaluations of group Rorschach revealed important differences between the groups. The evaluation and test data of 14 cadets who failed are included. The practical application of these findings to flight instruction training and selection is discussed.

4168
Fokkema, S. D.
[THE PRINCIPAL POINTS OF A PSYCHOLOGICAL ANALYSIS OF FLYING, WITH A COMMENT ON THE SELECTION AND RESEARCH METHODS] Hoofdpunten van een psychologische analyse van het vliegen, met een commentaar betreffende de selectie- en research-methoden. — Nederlands militair geneeskundig tijdschrift (Gravenhage), 8 (12): 325-337. 1955. In Dutch. DLC (RC971.N4, v. 8)

The learning processes involved in flight training, and the flying process itself, are analyzed within a Lewinian field-theoretical frame of reference. Certain conclusions are drawn in regard to the personality type most suited for flying, motivational aspects, and emotional control. The pilot selection procedures at present in use have been developed on the basis of practical assumptions about the desirable personality characteristics of pilots. Selection officers act on subjective impressions formed about the presence or absence of these traits during an interview of the candidate. Application of aviation-psychological research to selection methods is discussed.

4169
Folk, G. E.
MODIFICATION BY LIGHT OF DIURNAL RHYTHM OF RUNNING ACTIVITY IN THE WHITE RAT [Abstract]. — Federation Proceedings, 14 (1^{I}): 49. March 1955. DLC (QH301.F37, v. 14)

Illumination during the activity phase of the diurnal rhythm in white rats was observed to cause a regular and constant alteration of the starting time of activity. The delay for rats in continuous light (5.1 foot candles) was 3/4 hours/day, so that the activity phase traveled around the clock in 16 days. During reversal of the 24-hour solar light cycle, the delay was 3 hours/day, and with a 16-hour light cycle of 8 hours of illumination and 8 hours of darkness, the delay was 1 hour/day. Rats reared with no cycle of nursing or other regular environmental influences showed evidence of an inherited rhythm of approximately 12 hours of activity and 12 hours of inactivity. Activity rhythms of 25, 26, and 27 hours were produced by exposure to continuous light, with the activity phase remaining 12 hours and the inactive phase increased in length.

4170
Fontaine, M.,
and F. Lachiver
[THYROID AND CHEMICAL THERMOREGULATION] Thyroïde et thermoregulation chimique. — Archives des sciences physiologiques (Paris), 9 (4): C63-C79; discussion, p. C79-C81. 1955. In French. DNLM

The role of the thyroid in the thermoregulatory response to environmental cold is discussed. The importance of the thyroid in thermoregulation is demonstrated by observations of seasonal fluctuations in the activity, weight, and histology of the gland in homeothermal and hibernating animals, and by observations of the histochemical and biochemical effects of experimental thyroidectomy and administration of thyroid hormones in cold-exposed homeothermal animals. Theories of the mechanism of thyroid activation by cold include direct stimulation of the gland by cold, humoral stimulation, and activation by the pituitary and hypothalamus. The regulation of thermogenesis by the thyroid is accomplished through elevation of the basal metabolism, increase of neuro-muscular activity, stimulation of the growth of fur or feathers, and possibly by intracellular action. (105 references)

4171
FOOD POISONING. — U.S. Air Force Medical Service Digest, 6 (2): 3-5. Feb. 1955. DLC

Outbreaks of gastroenteritis due to food poisoning are particularly disastrous when they incapacitate the air crew while in flight. Confirmation of diagnosis is important not only in the teeatment of the patient but also for the mobilization of preventive and countermeasures.

4172
Fornari, A.
(THE INJURIES OBSERVED ON THE PERSONS ON BOARD OF THE COMET DURING THE AIR ACCIDENT OCCURRED AT THE SOUTH OF ELBA ISLAND) Le lesioni corporee riscontrate sulle persone a bordo del Comet nell' incidente aereo a sud dell'isola d'Elba. — Rivista di medicina aeronautica (Roma), 18 (2): 251-308. 1955. In Italian, with English summary (p. 305).
DLC (TL555.A1R5, v. 18)

The results are given of autopsies and of histological examinations carried out on 15 victims of the crash of a British Comet jet airliner into the Mediterranean, south of Elba, on January 10, 1954. All indications point to the conclusion that death occurred almost instantaneously; thus, part of the injuries observed have to be classed as post-mortem. Death, in the majority of cases, could be attributed to two primary causes: (1) violent collision of the upper parts of the body with surrounding structures such as seats and cabin walls; and (2) explosive decompression, as evidenced by lesions of the inner organs, primarily the lungs (acute emphysema, hemorrhages, and alveolar overextension). Post-mortem injuries were caused by the impact the bodies underwent when the plane hit the water. Second- to third-degree burns were observed, which may be attributed to scalding by steam or by overheated gases. Most of the rescued bodies came from the tail section of the fusilage, which was the least affected in the accident.

4173
Forster, R. P.,
and J. Nyboer
EFFECT OF INDUCED APNEA ON CARDIOVASCULAR RENAL FUNCTIONS IN THE RABBIT. — Amer. Jour. Physiol., 183 (1): 149-154. Oct. 1955.
DLC (QP1.A5, v. 183)

The mechanism of cardiovascular and renal reflexive response to brief periods of apnea induced in rabbits by the presentation of tobacco smoke or other volatile irritant to the nostrils was studied. The procedure resulted in a marked reduction of urine flow, glomerular filtration rate, blood flow to the kidney, minute pulse volume, and heart rate, while arterial pressure remained unchanged, and pulse volume increased. The renal vasoconstrictor response was abolished by surgical or pharmacological denervation of the kidney. Atropine, an anticholinergic agent, abolished both cardiac and renal responses, as well as certain other typical manifestations of parasympathetic activity, such as excessive salivation and constriction of the pupils. The cholinergic reactions to apnea were interpreted as a conservative mechanism which may be a constant feature of the physiological architecture of vertebrates and which effects the conservation of oxygen during quiescent periods by shunting blood from some organs while maintaining a high rate of flow to others more dependent upon a vigorous circulation. (Quoted in part)

4174
Fowler, R.
CONTROL OF BODY WATER CONTENT: A STUDY OF DAY-TO-DAY VARIATIONS IN HUMANS AND RABBITS. — Australasian Ann. Med. (Sydney), 4 (2): 123-127. May 1955. DNLM

A statistical analysis of daily weight changes is presented in an attempt to describe the normal ranges of variation in body water content. It is noted that normal, random, limited variations in water content occur from day-to-day which are cyclic but not rhythmic. The significance of these variations in total body water content is discussed. (Author's summary, modified)

4175
Fowler, R. C.
DAMAGE TO ANIMALS DUE TO VIBRATION. —

Office of the Secretary of Defence, Research and Development, Washington, D. C., Supplement to Shock and Vibration Bulletin, no. 22: 16-18; discussion, p. 18-19. July 1955. DNLM

Nembutalized cats were vibrated at accelerations of 10 to 15 g at 5 to 20 c.p.s. until death occurred. Autopsy showed the presence of frothy material in the trachea, edema and hemorrhage in the lungs, occasional bruised areas over the ventricles of the heart, interfibrillar extravasation of blood throughout the myocardium, and engorgement of the larger mesenteric vessels. Blood pressure remained slightly elevated during vibration until 1-3 minutes before death, and then steadily declined to zero. Cardiac involvement is thought to have occurred before termination of respiration. Hematocrit and potassium were slightly elevated. The immediate cause of death has not been ascertained, but is attributed to mechanical damage to the heart and/or lungs.

4176
Franck, C.,
M. Lamarche, and P. Roze
[MODIFICATIONS IN RESISTANCE TO OXYGEN DEFICIT IN THE GUINEA PIG AFTER ADMINISTRATION OF DIHEXYVERINE] Modifications de la résistance au déficit en oxygène chez le Cobaye après administration de dihexyvérine. — Comptes rendus de la Société de biologie (Paris), 149 (23-24): 2201-2202. Dec. 1955. In French.
DLC (QP1.S7, v. 149)

The intraperitoneal injection of 0.5 or 1 mg. of dihexyverine per kg. of body weight reduced to approximately 1/4 the time of appearance of apnea in guinea pigs exposed to a simulated altitude of 13,000 m.

4177
Franke, E. K.
THE MECHANICS OF VIBRATION IN THE HUMAN BODY. — Office of the Secretary of Defense, Research and Development, Washington, D. C. Supplement to Shock and Vibration Bulletin, no. 22: 7-14; discussion, p. 14-15. July 1955. DNLM

Examples of research conducted by the Bio-Acoustics Section of Wright Air Development Center are discussed to illustrate the principles of the application of mechanics to the measurement of vibration in the human body. The approach to problems of body vibration consists of: (1) acquisition of experimental details sufficient to provide a comprehensive picture of body behavior in the situation studied; (2) construction of a model which is simpler than the human body but which produces the same response when substituted for the body in the experiment concerned; and (3) use of the model in a deductive manner to obtain new hypotheses which must permit experimental verification. Application of these principles has formed the basis for the choice of a semi-infinite, homogeneous, isotropic, visco-elastic medium with plane boundary as a substitute for the body surface, representation of the body in ballistocardiography as a system of point masses concentrated in a manner such as to give one degree of freedom, and the choice of a spherical shell model for the measurement of the vibration pattern of the skull.

4178
Frankel, B. L.,
L. Loiterman, and J. Hicken
RADIO NAVIGATION TRAINER. — U. S. Patent 2,709,308. May 31, 1955. 44 leaves. DP

A grounded navigation training apparatus is described and illustrated for teaching and practicing navigating an airplane by means of reception and interpretation of signals received from radio transmitting stations. This apparatus is economical and eliminates the hazards of airborne teaching.

4179
Fraser, D. C.,
and K. F. Jackson
EFFECT OF HEAT STRESS ON SERIAL REACTION TIME IN MAN. — Nature (London), 176 (4490): 976-977. Nov. 19, 1955.
DLC (Q1.N2, v. 176)

A small but significant rise in serial reaction time measured by the Cambridge visual vigilance test was observed in subjects exposed for one hour to ambient heat of 90° to 104°F.

4180
Fraser, D. C.
A STUDY OF FATIGUE IN AIRCREW. II. COMPARISON OF THE EFFECTS OF DAY AND NIGHT FLYING. — RAF Inst. of Aviation Medicine (Gt. Brit.), Farnborough; issued by Flying Personnel Research Committee (Gt. Brit.). FPRC 925, June 1955. 6 p. AD 70 129 UNCLASSIFIED

The fatigue of 19 aircrews in 11 daytime and 8 nighttime sorties was studied by determining the variability of the successive judgments (z-functions) of one member of each crew in a continuously graded vigilance-type task. The same individuals were tested when fresh to obtain a control score. The results indicated a significant difference ($P=0.03$) between the control and experimental scores for the day-flying groups and a more significant difference ($P=0.007$) for the night-flying groups. The increase in z-function of the night-flying group was significantly greater ($P=0.01$) than that of the day-flying group, and the variance of the experimental scores of both groups was significantly higher than that of their control scores. These findings suggest that: (1) a 15-hour flight in a piston-engine type aircraft is liable to produce aircrew fatigue; (2) fatigue is greater in night-flying; and (3) increasing stress tends to produce increasing variability of judgment both within and between subjects. (AD abstract)

4181
[FUTURE DRAFTING PRACTICES] Den fremtidige sessionsbehandling. — Militaerlaegen (København), 61 (1): 1-19. March 1955. In Danish.
DLC (RC970.D3, v. 61)

This is a discussion by officers and physicians of the Danish Armed Forces of the current examination of recruits by the Selective Service Board. Foreign practices, in particular in France, Holland, and Belgium, are reviewed; the Belgians have a stringent system of physical and psychological examinations, with the collected data stored on punched cards. No agreement was reached be-

tween those who wanted to retain or build on the old system, and those favoring the establishment of a permanent board of physiologists and psychologists to improve the selective system and reduce the percentage of personnel attrition.

4182
FRENCH-DEVELOPED HELICOPTER FLIGHT SIMULATORS FEATURE PANORAMIC VIEW OF TERRAIN. — Aero Digest, 70 (4): 72-74. April 1955. DLC (TL501.A292, v. 70)

A description is presented, including illustrations, of the D-X-50 helicopter flight simulator. The trainer is designed for beginners in order to establish proper reflexes and coordination. During simulated flight, the student receives visual impressions comparable to those seen during actual flight by means of a unique optical system involving a cylindrical motion picture screen and tilting ground plane which accurately reproduces three-dimensional motion. In addition, the flying characteristics of a large family of mono-rotor helicopters can be simulated by the D-X-50 flight simulator.

4183
French, E. G.
INTERRELATION AMONG SOME MEASURES OF RIGIDITY UNDER STRESS AND NONSTRESS CONDITIONS. — Jour. Abnormal and Social Psychol., 51 (1): 114-118. July 1955. DNLM

A battery of 7 tests of rigidity measuring different aspects of the variable and a test of achievement motivation were given to 50 male airmen under ego-involved conditions and to 50 under relaxed conditions. In addition the Armed Forces Qualification Test scores were available as a measure of intelligence. Ego-involved conditions did not produce an increase in rigid behavior. There was no evidence of a general interrelation between the various measures of rigidity. Ego-involved conditions produced no increase in interrelation between measures of rigidity. Achievement motivation increased under the ego-involved conditions. (Author's summary)

4184
French, E. G.,
and R. R. Ernest
THE RELATION BETWEEN AUTHORITARIANISM AND ACCEPTANCE OF MILITARY IDEOLOGY. — Jour. Personality, 24 (2): 181-191. Dec. 1955. DLC (BF1.J66, v. 24)

The California F-Scale, some additional items of the same kind, a Military Ideology Scale, and a question about Air Force career intentions were administered to 186 airmen undergoing basic training, once at the beginning of training and once every six weeks. Half of the subjects signed their papers and half answered anonymously. The hypothesis that F-Scale responses would be related to acceptance if military ideology was confirmed. In addition it was found that the relationship was greater when only items dealing with attitudes to authority, conventionalism, and "hardheadedness" were used than when those dealing with such variables as projectivity, sexual concern, superstition, etc., were included. F-Scale responses were found to be unchanged by military training but subject to increase under pressure of the combination of signing the papers and the first week of training. The experiment was repeated using 272 Officer Candidate School students and the findings duplicated those of the first experiment. (Authors' summary)

4185
French, E. G.
RELATION OF AN INDIRECT MEASURE OF ATTITUDE TO EXPRESSED MILITARY ATTITUDE. — Air Force Personnel and Training Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-72, Dec. 1955. v+6p. (Project no. 7704, Task no. 77099). AD 98 220 UNCLASSIFIED

An indirect, objective measure of attitudes was constructed for the purpose of predicting military attitude. The test was found to have good reliability, to yield similar distributions of scores under experimental and operational conditions, and to show some relation to a direct test of military attitude when both were administered under experimental conditions. An incidental finding of some interest was that distributions of responses selected in a multiple choice form of test did not differ from those obtained in a free response situation. (Author's summary)

4186
French, E. G.
SOME CHARACTERISTICS OF ACHIEVEMENT MOTIVATION. — Jour. Exper. Psychol., 50 (4): 232-236. Oct. 1955. DLC (BF1.J6, v. 50)

An independent measure of motivation (Test of Insight) and a performance test (digit-letter substitution) were given to 90 airmen under three different verbally induced conditions of achievement motivation. The results support the hypothesis that an individual's typical level of achievement motivation is a significant variable affecting the degree to which motivation can be aroused by experimental conditions. The resultant motivation is related to performance. Conclusions as to prediction of performance in different motivational settings are drawn.

4187
French, G. N.,
M. V. McPhaul, and R. S. Melton
SOME EFFECTS OF PHYSICAL TRAINING ON BREATHING, OXYGEN CONSUMPTION, AND OXYGEN EXTRACTION DURING MODERATE EXERCISE. — Naval School of Aviation Medicine, Pensacola, Fla. June 1, 1955. iv+[19] p. (Research Report no. NM 001 105 100.02). AD 73 199 UNCLASSIFIED

Intensive physical training of preflight naval aviation cadets produced significant changes in respiratory function, minute volume of breathing, and oxygen consumption required for a standard treadmill exercise. Oxygen breathing during exercise produced considerable reduction in minute ventilation in relatively unfit enlisted subjects, only small reduction in the physically fit cadets after training. (Authors' abstract)

4188
Friedberg, E. S.
VISUAL REQUIREMENTS AND EXAMINATION TECHNIQUES IN THE U. S. AIR FORCE. — Optical Jour. and Rev. Optometry, 92 (18): 40-41, 44, 50, 55, Sept. 15; (19): 28-32, Oct. 1; (20): 37, 40, 44, 46, Oct. 15; (21): 29-33, 41, Nov. 1, 1955. DNLM

Visual requirements for enlisted Air Force personnel are differentiated into (1) accetpable visual conditions (mild marginal blepharitis, simple chronic conjunctivitis, etc.), and non-acceptable conditions such as severe ocular diseases, difficulties of distance vision, ocular motility, accommodation, color vision, depth perception, and night vision. Presented are the prescribed examination techniques for visual tests including: general external and internal (ophthalmoscopic) examination; obtaining a history of ocular disease, injury, or surgery; and tests of ocular refraction, accommodation, convergence, color vision, field of vision, and red lens and cover tests. Attention is given to the classes of malingerers who wish to evade military service by feigning impairment of vision.

4189
Friedman, G.,
W. E. Hempel, and H. M. Detter
COMPARATIVE FACTOR ANALYSES OF THREE RADIO OPERATOR TRAINING CRITERIA. — Air Force Personnel and Training Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-2, Jan. 1955. vi+24 p. (Project no. 7700, Task no. 77014). AD 72 658 PB 120306

Separate studies were made of the factorial relation between variables of the Airman Classification Battery and three measures of success in Radio Operator General Technical School, including final school grade based on two different course weightings, and completion or failure of the basic code-learning phase of the school. Performance on several auditory tests was included in the analysis of the code-learning group. Common factors identified in all three analyses were mechanical experience, verbal comprehension, numerical facility, visualization, and perceptual speed. Educational background, interest in things versus ideas, and mechanical interest were found to be common to the two analyses involving final school grade. The factor of technical interest versus aversion to technical activities was confined to one of the latter analyses, and auditory discrimination to the analysis involving code-learning. The most significant variances were contributed by factors of visualization and numerical facility to the final grade analyses, by verbal comprehension to one final grade analysis, and by auditory discrimination and numerical facility to the code-learning analysis. The communality of the code-learning phase criterion was considerably higher than that of the other analyses as a result of the inclusion of auditory tests.

4190
Frost, R. H.
ESCAPE FROM HIGH-SPEED AIRCRAFT. — Aeronaut. Engin. Rev., 14 (9): 35-45. Sept. 1955. DLC (TL501.A326, v. 14)

Essentially the same, without illustrations, also issued as: Inst. of the Aeronautical Sciences, New York, N. Y. IAS Preprint no. 532, [no date]. 21 p. DLC (TL507.I55, no. 532)

This is a review of German, Swedish, British, and American experimentation with high-speed bailout. It is concluded that the use of the ejection seat is limited to speeds corresponding to little more than sonic flight at sea level, because the accelerations encountered at higher speeds in the first seconds after ejection approach human limitations (detailed data are given). Secondarily, there would be problems in retaining protective equipment and body extremities in the airblast. In view of these problems the use of a complete capsule presents many advantages over ejection seats. Several designs of capsules now in the experimental stage are described.

4191
Fruchter, B.,
R. R. Blake, and J. S. Mouton
SOME DIMENSIONS OF INTERPERSONAL RELATIONS IN THREE-MAN CREWS [Abstract]. — Amer. Psychologist, 10 (8): 327. Aug. 1955. DLC (BF1.A55, v. 10)

A rating scale of 44 items on various aspects of crew relations was administered to thirty B-47 crews in operational training to determine (a) the basic dimensions represented in peer assessments, (b) the reliability of the factors, and (c) their validity as a performance criterion. Each item formed a nine-point scale on which the crew members could rate themselves, the other crew members, or the crew as a whole. Five stable groups of item clusters were obtained, identified as technical competence, leadership, crew coordination, morale, and cooperation. Intercorrelations among the five groups yielded two second-order factors. It was concluded that meaningful and reliable dimensions of interpersonal relationships can be derived from the direct assessments of three-member bomber crews. Such dimensions are valid when used to predict a performance criterion.

4192
Fryer, D. I.
CONSEQUENCES OF LOSS OF CABIN PRESSURE. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 68-78. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

Analysis of factors involved in the effects of explosive decompression (anoxia, gas expansion, lung expansion) has not been sufficiently developed to allow a confident assessment of risks from knowledge of the rate and range of pressure change in a given circumstance. A satisfactory theoretical basis has been established, however, for the explanation of the mechanical factors involved in lung damage. It is suggested that careful design of aircraft "weak spots" and personal equipment may greatly reduce the risk from the more probable types of cabin failure.

4193
Frykholm, A.
[AEROMEDICAL OPINIONS ON SYNCOPE] Flygmedicinska synpunkter på swimning. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (3): 9-14. 1955. In Swedish. DNLM

The main etiological factors in the development of syncope in flight personnel are discussed as revealed in a statistical analysis of primary and secondary medical factors contributing to flight accidents or narrow escapes in the Swedish Air Force from 1950 through 1954. Medical reasons (acceleration stress, lack of oxygen) were directly responsible for five of the 91 accidents resulting in the pilot's death; in 16-19 cases medical causes were a contributory factor. There were 26 to 35 cases of narrow escape, where the pilot was stricken by illness while in the air, and 11-12 cases of syncope. Typical case histories are presented where the condition was caused by anoxia, sudden changes in barometric pressure, acceleration stress, supersensitive sinus caroticus, and heatstroke. It is pointed out that even slight infections reduce tolerance to stresses.

4194
Fucci, P.
[CONTRIBUTION TO THE STUDY OF LESIONS PRODUCED BY FLIGHT ACCIDENTS] Contributo allo studio delle lesioni prodotte da disastro aereo. — Rivista di medicina aeronautica (Roma), 18 (4): 857-874. Oct.-Dec. 1955. In Italian, with English summary (p. 872-873). DLC (TL555.A1R5, v. 18)

Postmortem studies are presented on the injuries incurred by eight casualties of an aircraft crash. Injuries are discussed in relation to the following: mechanism of production, site, pathology, classification, and medico-legal aspects. Fatal lesions were found on the head, thorax and abdomen, with ecchymoses on the anterior part of the body. Postmortem lesions were localized principally at the level of the extremities (fractures), along with skin and muscle lacerations.

4195
Fulkerson, S. C.
INDIVIDUAL DIFFERENCES IN REACTION TO FAILURE-INDUCED STRESS [Abstract]. — Amer. Psychologist, 10 (8): 336-337. Aug. 1955. DLC (BF1.A55, v. 10)

The Minnesota Multiphasic Personality Inventory and the McKinney Reporting Test, which introduces a stress experience during testing, were administered to 284 Air Force trainees (146 with signs of poor adjustment and 138 showing superior adjustment). Subjects who shifted toward accurate performance on the McKinney test under stress conditions had significantly higher Pt scores (obsessive-compulsive tendencies) and somewhat lower Hy (hysteric tendencies) than subjects who shifted toward inaccurate performance. These tendencies were stronger within the poorly adjusted group. This suggests that the change in accuracy was a function of the tendency to use hysteric or obsessive-compulsive defense mechanisms, and that the strength of the defenses was a function of the level of adjustment. The absolute level of accuracy did not show a consistent relationship to the MMPI scores. There were indications that absolute accuracy may have been a function of the degree of motivation for doing well on the test.

4196
Fulton, J. F.
LOUIS H. BAUER AND THE RISE OF AVIATION MEDICINE. — Jour. Aviation Med., 26 (2): 92-103. April 1955. DLC (RC1050.A36, v. 26)

A review is presented of the past few decades of progress in the field of aviation medicine and the advances with which Louis H. Bauer has been associated. His efforts in establishing the first school for flight surgeons are mentioned, as well as the text which he wrote at that time. The appointment of Dr. Bauer as Medical Director of the Aeronautics Branch of the U. S. Bureau of Air Commerce is discussed. The research completed between the two World Wars is touched upon; and the work of E. C. Schneider, W. M. Boothby, and H. G. Armstrong during this period is described. The author mentions the founding of the Aero Medical Association through the efforts of Dr. Bauer, and the establishment of the Journal of Aviation Medicine, which he edited from 1931-1954. Other subjects are discussed: the original acceleration studies made on the human centrifuge, anti-blackout suits, decompression sickness, flight safety, and the formation of the Committee on Aviation Medicine of the National Research Council. Dr. Bauer's service as a member of the board of trustees of the American Medical Association and his subsequent terms as president-elect and president of this organization are also included.

4197
Gagnon, P.-M.,
and A. Desmarais
[CONDITIONING, BY EXPOSURE TO COLD, OF THE THYROID RESPONSE TO THYROTROPIN IN THE HYPOPHYSECTOMIZED RAT] Conditionnement, par l'exposition au froid, de la réponse thyroïdienne à la thyrotrophine chez le Rat hypophysectomisé. — Comptes rendus de la Société de biologie (Paris), 149 (15-18): 1726-1728. Aug.-Sept. 1955. In French. DLC (QP1.S7, v. 149)

Hypophysectomized rats received daily varying doses of thyrotropin during exposure for four days to temperatures of either 24° or 14° C. Thyroid activity, as measured by the thickness of thyroid epithelium, increased progressively in both temperature groups with greater doses of the hormone, but showed a greater increase in animals exposed to cold. It is suggested that the activation of certain endocrine glands (specifically, the thyroid) during exposure to cold may occur without pituitary influence.

4198
Ganong, W. F.,
W. F. Bernhard, and J. D. McMurrey
THE EFFECT OF HYPOTHERMIA ON THE OUTPUT OF 17-HYDROXYCORTICOIDS FROM THE ADRENAL VEIN IN THE DOG. — Surgery, 38 (3): 506-512. Sept. 1955. DNLM

A decrease in adrenal blood flow and in the adrenal output of 17-hydroxycorticoids was observed by cannulation of the right adrenal vein in hypothermic (24-26° C.) dogs. The reduction in cortical hormone output was unaffected by additional surgical stress or by injection of ACTH. Normal adrenal blood flow and corticoid output were restored by rewarming. Hemorrhagic shock in an animal at normal body temperature produced a marked decline in adrenal blood flow but increased the corticoid concentration of the adrenal venous blood. It is concluded that hypothermia causes a specific depression of adrenocortical hormone secretion.

4199
Garvey, W. D.,
and L. L. Mitnick
EFFECT OF ADDITIONAL SPATIAL REFERENCES ON DISPLAY-CONTROL EFFICIENCY. — Jour. Exper. Psychol., 50 (4): 276-282. Oct. 1955. DLC (BF1.J6, v. 50)

Two experiments were conducted to determine the effect of additional spatial references on display-control efficiency. The results indicated: (1) the degree of isomorphic relationship between S-R sets is an important determinant of display-control efficiency; (2) the efficiency of a display-control system can be further enhanced by providing the operator with additional spatial references on the system where the internal interference among stimuli is greatest; (3) the addition of spatial references, after internal interference had been reduced to a minimum, does not further enhance performance; and (4) the addition of an excessive number of spatial references significantly deteriorates performance. (Authors' summary, modified)

4200
Gay, L. N. 1954
LABYRINTHINE FACTORS IN MOTION SICKNESS. — Internat. Record Med., 167 (12): 628-630. Dec. 1954. DLC (R11.M745, v. 167)

A brief review is presented of the experiments concerned with the etiology (accelerations, visual and psychological factors) of motion sickness. Studies of the labyrinth have crystallized the conclusion that it is the most important anatomical area in the causation of motion sickness. Disturbances of the labyrinth by trauma or disease induce nausea, vomiting, and dizziness which result in the same symptoms produced in the organ by motion of a ship, airplane, or land vehicle. The prevention and therapeutic control of vestibular disturbances and motion sickness with dimenhydrinate are noted.

4201
Geldard, F. A.
THE UTILIZATION OF CUTANEOUS RECEPTION FOR COMMUNICATIONS. — In: Office of Naval Research, Symposium on physiological psychology, p. 44-57. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100 UNCLASSIFIED

Research on alternate sensory pathways for the needs of communication revealed the cutaneous sense to be somewhat similar to auditory senses in the speed and range of sensory discrimination. The strategical location in terms of sensitivity of receptors and noninterference with the performance of other tasks seems to be the chest area. Of the five stimulus dimensions possible, differentiation in time, locus, and intensity was carried out with highest accuracy. Psychophysical measurements involving fractionation of the range of temporal, intensity, and locus discriminations in equal just-noticeable-difference steps, led to the conclusion that untrained subjects are able to identify safely at least 3 steps of intensity, 3 of duration and 4 different locations. The possible 36 combinations allow a coding system encompassing all letters of the alphabet and all digits.

4202
Gelfan, S.,
and I. M. Tarlov
DIFFERENTIAL VULNERABILITY OF SPINAL CORD STRUCTURES TO ANOXIA. — Jour. Neurophysiol., 18 (2): 170-188. March 1955. DLC (QP351.J6, v. 18)

Electrical responses to dorsal-root or sciatic-nerve stimulation were recorded from the dorsal surface and a ventral root of the lumbo-sacral spinal cord in dogs during anoxia (produced by asphyxia, breathing of nitrogen, or local ischemia). Anoxia progressively eliminated the potential deflections according to a definite pattern determined by the survival times of the various spinal cord components. The first structures to be blocked were the motor-neuron somas, followed by the interneurons, and finally the dorsal-column fibers. Recovery of any structure upon termination of anoxia was delayed in proportion to the time its function had been blocked. The maximal duration of anoxia beyond which recovery failed corresponded to the same patterns of sensitivity of the individual structures.

4203
Gelineo, S.
[TEMPERATURE OF ADAPTATION AND NUTRITION] Temperatura adaptacije i ishrana. — Arhiv za higijenu rada (Zagreb), 6 (4): 295-301. 1955. In Serbo-Croatian, with English summary (p. 300-301). DLC (RA421.A69, v. 6)

White rats fed bacon, carp, and boiled starch ad libitum were placed alternately in cold (+6 to -8°C.) and warm (23-27° C.) environments for periods of two weeks in each. Daily food consumption per 1 g. of body weight with regard to fat and protein was twice as high in the cold environment as in the warm; starch consumption was slightly higher in the warm environment. When food was chosen ad libitum, fat was the main source of calories for both groups. Protein consumption increased as the temperature of adaptation decreased.

4204
Gell, C. F.,
B. D. Polis, and O. Bailey
EFFECT OF ACCELERATION STRESS ON THE POTASSIUM AND SODIUM CONCENTRATION OF RAT BRAIN. — Amer. Jour. Physiol., 183 (1): 23-26. Oct. 1955. DLC (QP1.A5, v. 183)

An investigation was made of the sodium and potassium content of Wistar rat brains after the animals were subjected to experimental acceleration stress and tie stress. The significant finding of this study was the marked shift in ratio of potassium to sodium that occurred in the brain of the rats exposed to acceleration stress when compared to tie stress and normal control. The results indicate that an apparent electrolyte imbalance occurs in the brain of Wistar rats under acceleration stress. This aberration may be of value for further study of the factors contributing to disturbances in brain metabolism and function under acceleration stress. (Authors' summary)

4205
Gell, C. F.,
and P. W. Gard
THE PROBLEM OF ACCELERATION. — In:

Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 29-47. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

Minute accelerations (rough air, vibration, noise) are noted which cause disorientation, airsickness, and physiological and psychological fatigue of the aviator during flight. The nature is described of linear, centrifugal (radial) and angular accelerations, and their physiological effects on body circulation, respiration, vision, and fluids as demonstrated by animal experiments and tests using the human centrifuge. Mention is made of the anti-blackout suit developed to protect the airman against radial acceleration, and of the ejection seat developed for his escape from uncontrolled and spinning high-speed aircraft.

4206
Gell, C. F.
THE PROBLEM OF REDUCED BAROMETRIC PRESSURES. — In: Bureau of Medicine and Surgery, Aviation medicine practice, p. 7-28. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

The physiological effects of reduced barometric pressure are described, and the methods and means by which flying personnel are provided with a normal or near-normal environment at high altitude. Discussion is presented under the following subject headings: (1) physics of the atmosphere; (2) anoxia; (3) expansion of free gases in the intestinal tract, middle ear, and paranasal sinuses at altitude; (4) aeroembolism; (5) oxygen equipment in aviation; (6) temperature variants in aviation as a problem, including clothing; (7) noxious gases in aviation, and (8) pressurized equipment and explosive decompression.

4207
Gellhorn, E.
[DISCUSSION ON TEMPERATURE AND THE AUTONOMIC NERVOUS SYSTEM] Diskussionsbemerkungen über Temperatur und das autonome Nervensystem [Abstract]. — Acta neurovegetativa (Wien), 11 (1-4): 90-93. 1955. In English. DNLM

Cooling of the body of cats to 25°-20° C. by immersion decreases the sympathetic excitability of the hypothalamus, as shown by (a) the reduction of the rise in blood pressure and pulse rate, and a decrease in the contraction of the nictitating membrane; (b) the enhancement of the depressor effect of acetylcholine, mecholyl, and histamine on blood pressure. Raising of the body temperature from 37° C. to 40° C. increases the sympathetic excitability of the hypothalamus, whereby hypothalamic stimulation evokes stronger sympathetic reactions than at normal body temperature.

4208
George Washington Univ.
NEEDED SURVIVAL RESEARCH. — Ed. by E. G. Pattishall. George Washington Univ., Washington, D. C. (Contract AF 18(600)-1180). Technical Report, Nov. 1955. 22 p. DNLM
UNCLASSIFIED

An integrated summary is presented of comments, criticisms, and recommendations concerning the Air Force Survival Research Program made by a scientific panel which met at the Aero-Medical Laboratory, Wright-Patterson Air Force Base, Ohio, on Aug. 25-26, 1955. Subjects discussed include survival equipment, nutrition, marine and plant biological hazards, psychological principles of behavior, survival medicine, climatology, geography, heating, insulation, and communication. Specific recommendations on selected survival topics are included in a series of appendices [abstracted as items 4306 and 4307].

4209
Gerall, A. A.,
and R. F. Green
THE EFFECT UPON PERFORMANCE ON A FOLLOWING TRACKING TASK OF INTERCHANGING THE DIRECTION OF DISPLAY MOVEMENT CONTROLLED BY EACH HAND. — Univ. of Rochester, Dept. of Psychology, New York (Contract N6onr-241, T.O.6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-24, Aug. 1, 1955. 6 p. (SPECDEVCEN Project no. 20-M-1d). AD 109 355 UNCLASSIFIED

The change in performance was investigated on a following-tracking problem after the continuity relationship between the controls and display was modified by interchanging the axes of the target follower movement controlled by two hands. A modified two-hand coordination test was used to provide the following tracking task. Righthanded subjects were selected randomly from the available group of enlistees. The degree of continuity between the axes of movement of the target follower and control units determined the level of proficiency obtained. The learning advantage gained by previous practice under one set of conditions did not persist under different conditions. Transfer of training from one set of controls to another is not related in any uniform way to the continuity relationships that exist between the controls. (AD abstract)

4210
Gerall, A. A.,
P. B. Sampson, and S. D. S. Spragg
AN ELECTRONIC APPARATUS FOR STUDYING TRACKING PERFORMANCE. — Amer. Jour. Psychol., 68 (2): 297-305. June 1955. DLC (BF1.A5, v.68)

The design and operation of a two-handed tracking apparatus at present used in study of simple tracking is described. The apparatus is adaptable to a wide range of researches in perceptual-motor performances. With appropriate modifications it can be adapted for study of continuous tracking or investigations of different types of control units.

4211
Gerathewohl, S. [J.]
[ON ORIENTATION IN THE GRAVITY-FREE STATE] Zur Frage der Orientation im schwerefreien Zustand. — In: Space-flight problems [International Astronautical Congress, 4th (Zurich, 1953), Proceedings], p. 189-195. Biel, 1954. In German. DLC (TL787.I44, 4th, 1953)

The problems of orientation expected to arise in a weightless state are discussed. Photographic records of the behavior of mice during experimental flights in a V-2 rocket and two Aerobee

rockets are presented as evidence of the disturbances of labyrinthine functioning. The mice with destroyed labyrinths were less confused and showed better adaptive behavior than the ones with functioning labyrinths. Experiences of the test pilots, S. Crossfield, C. Yeager, and others with reduced gravity in parabolic flights indicate no serious disturbances of orientation as long as visual reference is possible and the individual is securely strapped to his seat. The author suggests that the Weber-Fechner law of the relation between the intensity of sensation and the strength of the stimulus may not hold for conditions of weightlessness, i.e. unnatural stimulus ranges.

4212
Gerathewohl, S. J.
BRIGHTNESS CONTRAST AND TARGET IDENTIFICATION: THRESHOLDS ON THE RADAR PPI. — Jour. Aviation Med., 26 (5): 399-408. Oct. 1955. DLC (RC1050.A36, v. 26)

A study of contrasts in brightness at various target identification thresholds and appearance levels on the radar plan position indicator has shown that brightness and contrast differences seem to exist between the 2 types of sweep rotations (sector scanning and continuous rotating sweep); 2 degrees of basic sweep brightness (maximal and minimal excitation); and 5 target identification thresholds or video gain settings (target detection, target recognition, optimum target definition, maximum gain voltage, and maximum gain setting clockwise). The author witholds quantitative analysis of the results until a future date; but he states that target and background appear brighter and that differences between maximum and minimum contrast are smaller with sector scanning; also, the practical range of brightness contrast between the target and background lies within the first 3 identification thresholds. The major variables in radar scope interpretation, namely, brightness contrast and the uniformity of the viewing conditions are discussed.

4213
Gerathewohl, S. J.
A STUDY OF TARGET APPEARANCE ON THE RADAR SCOPE USING VARIOUS ELECTRICAL PARAMETERS, FILTERS, AND SWEEP CHARACTERISTICS [Abstract]. — Amer. Psychologist, 10 (8): 489. Aug. 1955. DLC (BF1.A55, v. 10)

Brightness and contrast differences were found between the two types of sweep rotation, two degrees of basic sweep brightness, five levels of target appearance or video gain setting, and four kinds of sweep covers. Sectoring yields in general higher contrasts than continuous sweep rotation. The optimum contrasts were found at the target recognition and optimum definition level; the lowest, when the video gain setting was at its maximum. Polaroid filters or sweep covers cut peak brightness, and thereby brightness contrast, during maximum excitation.

4214
Gerschman, R.,
and W. O. Fenn
ASCORBIC ACID CONTENT OF ADRENAL GLANDS OF RATS IN OXYGEN POISONING. — In: Studies on oxygen poisoning, p. 1-4. Univ. of Rochester, N. Y.; issued by School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-1201-0013). Report no. 10, Feb. 1955. AD 82 544 UNCLASSIFIED

Rats maintained in an atomosphere of pure oxygen showed no significant change in the ascorbic acid concentration of the adrenal glands until after two or three days of exposure. Symptoms of severe oxygen poisoning observed after 65 hours were associated with a sharp drop in ascorbic acid. Exposure for 30 minutes to 2 or 7 atmospheres caused a decline in ascorbic acid content in either oxygen or air.

4215
Gerschman, R.,
D. L. Gilbert, S. W. Nye, W. E. Price, and W. O. Fenn
EFFECTS OF AUTONOMIC DRUGS AND OF ADRENAL GLANDS ON OXYGEN POISONING. — Proc. Soc. Exper. Biol. and Med., 88 (4): 617-621. April 1955. DLC (QP1.S8, v. 88)

Adrenal demedullation protected mice against high oxygen pressure, but not as much as adrenalectomy. Epinephrine partially reversed the protective effect of adrenalectomy, whereas cortisone and adrenal cortex extract could completely abolish the beneficial action of adrenalectomy. With autonomic drugs the following observations were made: (2) Sympathomimetic drugs; tryptamine and oxytyramine had a protective action, whereas epinephrine and norepinephrine had a detrimental influence. (b) Sympatholytic drugs; dibenzyline alone had a protective effect and counteracted the detrimental effects of epinephrine and norepinephrine. (c) Parasympathomimetic drugs; doryl and mecholyl chloride bestowed a significant protection. (d) Parasympatholytic drugs; atropine alone decreased the survival time of mice and completely nullified the protective effect of mecholyl chloride. (Authors' summary, modified)

4216
Gershenovich, Z. S.,
A. A. Krychevshaĭa, and L. P. Alekseenko
[ADRENERGIC SUBSTANCES OF THE BRAIN AND OF THE ADRENALS AT INCREASED OXYGEN PRESSURE] Adrenergicheskie veshchestva mozga i nadpochechnikov pri povyshennom davlenii kisloroda. — Ukrainskiĭ biokhimichnyi zhurnal (Kiev), 27 (1): 3-11. 1955. In Russian. DLC (QP501.U58, v. 27)

Increase in oxygen pressure brought about changes in the ratio between the adrenergic substances of the brain and of the adrenals. The process of adrenaline breakdown in the brain was enhanced just before the onset of convulsions; it rose considerably during the convulsion period, and again during the terminal period. The preconvulsion period was characterized by a notable accumulation of adrenaline. During the convulsion and terminal periods the specific adrenal functions were depressed, and possibly disturbed, phenomena which were reflected at first in a reduced adrenaline content, and at a later stage in its complete disappearance from the adrenals.

4217
Getline, G. L.
VIBRATION TOLERANCE LEVELS IN MILITARY AIRCRAFT. — Office of the Secretary of Defense, Research and Development, Washington, D. C. Supplement to Shock and Vibration Bulletin, no. 22, p. 24-27; discussion, p. 27. July 1955. DNLM

An attempt was made to correlate presently available experimental data concerning subjective responses to vibration with the experience of the U. S. Air Force in the operation of military aircraft. Comparison of various experimental tolerance curves with Air Force tolerance curve defining intolerable vibration levels (resulting in complaints) in propeller-driven and turbo-jet aircraft as a function of the frequency and amplitude of aircraft vibra- indicates that the acceptable level of vibration in aircraft includes levels greater than Janeway's "comfort level", but is lower than Goldman's tolerance curve. It is believed that the Air Force virbration tolerance curve defines a level of vibration above which general discomfort and at higher frequencies, numbing of hands and feet may occur.

4218
Ghinozzi, G. P.
[EFFECT OF AGE AND FLIGHT ACTIVITY ON BLOOD CHOLESTEROL IN A GROUP OF SUBJECTS IN THE ITALIAN AIR FORCE] Influenza dell' età e dell' attività di volo sulla colesterinemia di un gruppo di soggetti appartenenti all' aeronautica italiana. — Rivista di medicina aeronautica (Roma), 18(3): 709-718. July-Sept. 1955. In Italian, with English summary (p. 716). DLC (TL555.A1R5, v. 18)

Total and esterized blood cholesterol was determined in 240 subjects (150 pilots) between 20 and 55 years of age. Blood cholesterol concentration was found to increase with age. Subjects in the 50-55 age group with intensive flight activity displayed a slight increase in blood cholesterol values as compared with those who had never flown.

4219
Giaja, J.,
and L. Marković-Giaja
[THE SPECTRUM OF THERMOGENESIS IN THE COOLED ORGANISM] Le spectre de la thermogenèse de l'organisme refroidi. — Archives des sciences physiologiques (Paris), 9 (4): C23-C32; discussion, p. C32-C34. 1955. In French. DNLM

A metabolic spectrum was constructed from experimental data to describe the thermogenetic state of rats exposed to varying ambient temperatures. The spectrum includes the states of: (1) euthermia, extending from a basal thermogenesis of 6.67 cal./kg./hr. at an environmental temperature of 32° C. to a maximum normal thermogenesis of 21.04 cal./kg./hr. at -16°.; (2) hypothermia, which includes a thermogenetic state above the basal metabolism but at lowered body temperature and a poikilothermal state in which metabolism may be decreased to one-eighth the basal level; and (3) hyperthermia in which the metabolism is stimulated by a warm ambient temperature, and may reach a level of 60% higher than the basal metabolism.

4220
Gibert, A. P.
[OXYGENATION AT ALTITUDE OF PATIENTS WITH CERVICAL-MAXILLARY-FACIAL INJURIES DURING THEIR TRANSPORTATION BY AIR] Oxygénation en altitude de blessés cervico-maxillo-faciaux au cours de leur transport par voie aérienne. — Médecine aéronautique (Paris), 10 (3): 277-279. 1955. In French. DLC (TL555.M394, v. 10)

The supply of oxygen during transportation at high altitudes to patients unable to wear an oxygen mask because of face, neck, or jaw injuries is discussed. In the case of face-jaw injuries, the Nelaton nasal tube is recommended as the appropriate means of supplying oxygen. Skill in the insertion of the tube is required to avoid hemorrhage and interference by the tongue. In the case of face-neck injuries, tracheotomy or tracheostomy make insertion of the tube relatively easy, but care must be taken to avoid loss of the oxygen supply by ejection or clogging of the tube. In every case, the functioning of the equipment must be checked before transportation is initiated.

4221
Gibson, E. J.,
R. Bergman, and J. Purdy
THE EFFECT OF PRIOR TRAINING WITH A SCALE OF DISTANCE ON ABSOLUTE AND RELATIVE JUDGMENTS OF DISTANCE OVER GROUND. — Jour. Exper. Psychol., 50 (2): 97-105. Aug. 1955. DLC (BF1.J6, v. 50)

The effect of preliminary training on the absolute judgments of distance in yards and relative judgments of distance to variable targets was investigated. Absolute estimation of distance was improved in subjects by preliminary training, although testing took place in an unfamilar environment with varied distances. It was proposed that the subject learned a psychophysical scale relating distance judgment in yards to gradients of stimulation from the ground surface. Pretraining with a distance scale, however, did not lower the difference limen for judgments of relative nearness or farness.

4222
Gibson, J. J.,
J. Purdy, and L. Lawrence
A METHOD OF CONTROLLING STIMULATION FOR THE STUDY OF SPACE PERCEPTION: THE OPTICAL TUNNEL. — Jour. Exper. Psychol. 50 (1): 1-14. July 1955. DLC (BF1.J6, v. 50)
Reprint issued as: Cornell Univ., Ithaca, N. Y. (Contract AF 33 (038)22373); issued by Air Force Personnel Training Research Center, Lackland Air Force Base, Tex. [Report no. AFPTRC TN-55-58], Dec. 1955. AD 102 530 UNCLASSIFIED

A method is described for inducing and controlling a perception of surface and space. Conclusions are: (a) There is evidence that surface quality depends on the density of transitions in the optical stimulus. When the transitions are absent, surface quality disappears. (b) There is evidence that the gradient of texture density in isolation need not always determine the qualities of slant and recession. It is ambiguous, but only with respect to the members of a family of surfaces. (c) There is evidence that the gradients of textural disparity and motion can determine the qualities of slant and recession. Presumably when the gradients are concomitant, ambiguity is removed. (Authors' summary)

4223
Gibson, J. J.
THE OPTICAL EXPANSION-PATTERN IN AERIAL LOCOMOTION. — Amer. Jour. Psychol., 68 (3): 480-484. Sept. 1955. DLC (BF1.A5, v. 68)

Changes in the optical pattern of expansion and/or flow in the visual field provide information which governs locomotor behavior. The sensory symptoms, indicators, or cues inherent in motion-perspective guide in feed-back manner the progress, cessation, and direction of locomotion and indicate future contact which is desired or to be avoided. Analysis of different tasks involved in aerial locomotion within this theoretical framework offers five hypotheses of choice of motor responses in control, leveling off, landing, avoidance of obstacles, and pursuit. Parallels are drawn between the above tasks and pursuit tracking.

4224
Gibson, J. J.,
P. Olum, and F. Rosenblatt
PARALLAX AND PERSPECTIVE DURING AIRCRAFT LANDINGS. — Amer. Jour. Psychol., 68 (3): 372-385. Sept. 1955. DLC (BF1. A5, v. 68)

The accepted formulation of monocular motion parallax as a cue to distance is shown to be insufficient, particularly when applied to the problem of locomotion relative to a surface such as the earth. A more general description of the parallax phenomenon is given under the name "motion perspective". The latter holds for an observer's movement along any line parallel or inclined to any extended surface, which includes the case of aircraft landings. A mathematical analysis of motion perspective is presented in terms of the optical flow-pattern reflected from a surface to an eye. It is shown that the variables of this flow-pattern are specific not only to the "depth" of the surface but also to the movement of an observer. Assuming that these variables are stimuli for perception, they can determine not only the experience of a stable tridimensional world, but provide a basis for the judgments required for the control of locomotion in that world. (Authors' summary)

4225
Gibson, J. J.,
and O. W. Smith
THE PERCEPTION OF MOTION IN SPACE. — In: Office of Naval Research, Symposium on physiological psychology, p. 117-124. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100 UNCLASSIFIED

The authors report on the experimental design and apparatus used to investigate the psychophysics of translatory motion of the image, where all parts of the retinal image move at the same speed and in the same direction. The three modes of optical motion-stimulation involved pursuit movements of the eye, fixation, and peripheral fixation. There was little difference in the accuracy of velocity judgments under the first two conditions. In peripheral fixation the accuracy decreased considerably. The accuracy of speed matches was greater when motions were in the same direction, and when they were horizontal.

4226
Gierke, H. E. von
EAR PROTECTOR. — U. S. Patent 2,719,523. Oct. 4, 1955. 2 leaves. DP

A modified personal earplug is described and illustrated constructed to increase the protection of the human ear at low sound frequencies, a problem pronounced by the development of propellar and jet noises. It is a comfortable, cylindrical earpiece fitting into the auditory canal, establishing an air-tight seal, and connected to an earpiece extending outwardly. Sound is reduced uniformly up to a frequency of 1000 cycles per second.

4227
Gilinsky, A. S.
THE EFFECT OF ATTITUDE UPON THE PERCEPTION OF SIZE. — Amer. Jour. Psychol., 68 (2): 173-192. June 1955. DLC (BF1. A5, v. 68)

The perception and the estimation of object size was studied as the distance of a standard object (white isosceles triangle, 42, 54, 66, or 78 in. in base and altitude) was varied from 100 to 4000 ft. out of doors. Functions relating the adjusted size of a variable triangle, 100 ft. away from the subject, to the distance of each standard triangle were obtained from 32 to 36 subjects. Each subject served under two different conditions of instruction which demanded contrasting sets; a set for matching "objective" size and a set for matching "retinal" size. Two distinct functions relating the settings of the variable triangle to distance were produced: (1) "objective" instructions gave matches in size which increased with distance, exceeding size-constancy, (2) "retinal" instructions gave matches in size which decreased as distance increased. This relation between perceived size and distance is intermediate between the function for size constancy and the function for matches of retinal image or visual angle. (Author's summary, modified)

4228
Gilinsky, A. S.
THE RELATION OF PERCEIVED SIZE TO PERCEIVED DISTANCE: AN ANALYSIS OF GRUBER'S DATA. — Amer. Jour. Psychol., 68 (3): 476-480. Sept. 1955. DLC (BF1. A5, v. 68)

The author disputes rejection of the hypothesis that perceived size is proportional to perceived distance, on the basis of data presented by H. E. Gruber [see item no. 2849, vol. III]. An alternative interpretation of the data yields a definite and mathematically predictable relation between perceived size and perceived distance, which allows empirical determination of the parameters governing both size and distance perception.

4229
Glaser, E. M.
SIDE EFFECTS OF REMEDIES FOR MOTION SICKNESS. — Internat. Record Med., 168 (1): 23-31. Jan. 1955. DLC (R11. M745, v. 168)

Assessment is made of the side effects (drowsiness, headache, giddiness, dry mouth) of motion sickness drugs by means of the double-blind method (whereby drugs and placebos are issued by code) and the crossing-over method (whereby each subject gets in turn each drug and a placebo). Drugs that prevent motion sickness best have a hyoscine-like central nervous action on dry land and in the presence of motion exhibit fewer side effects. It is suggested that side effects in persons treated

for motion sickness may be caused by motion, and that some side effects are inhibited by drugs.

4230
Glorig, A.
THE DOCTOR STUDIES NOISE IN INDUSTRY. — National Safety News, 71 (4): 24-25, 120-128. April 1955. DNLM

The techniques and test rooms used for the measurement of hearing are discussed. Industrial hearing conservation programs require that: (1) all routine preplacement physical examinations include air-conduction threshold audiometry; (2) all persons working in noisy areas suspected of having suffered a hearing loss, whether temporary or permanent, be followed with hearing checks every 6-12 months; (3) all suspected areas be studied for possible noise reduction procedures, and (4) educational programs regarding ear protectors be instituted.

4231
Glover, H. C.
LIGHT TRANSMISSION AND HAZE REQUIREMENTS FOR TRANSPARENT ENCLOSURES. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-55, April 1955. iv+4 p. (Project no. 7157). AD 75 479 UNCLASSIFIED

An analysis is made of the effects upon visibility induced by various transparencies through which aircrew members must perform the visual tasks of flying. Ranges of light transmission and haze values are established to define limits which are highly desirable, values acceptable if other factors take precedence, and minimum light transmission and maximum haze values which can be tolerated. The further reduction in light transmission induced by the angle of incidence of sloping windshields and its effect upon night visibility are evaluated. (Author's abstract)

4232
Goetz, M.
PROBLEMS OF SIMULATIONS WITH HUMAN SUBJECTS. — In: Aeronautical Electronics Digest, 1955 (National Conference on Aeronautical Electronics, Dayton, Ohio, 1955), p. 186-187. DLC (TL693.A3, 1955)

Some of the basic techniques of planning and execution of experiments simulating man-machine systems are discussed.

4233
Götzlinger, J., and E. Helsing
A "HUMAN CENTRIFUGE" FOR RESEARCH INTO PHYSIOLOGICAL FLIGHT STRESSES. — ASEA Jour. (Västerås, Sweden), 28 (5-6): 75-83. May-June 1955. In English. DLC (TK1.A68, v. 28)

A description, including illustrations, is presented of a human centrifuge for research into physiological flight stresses at the Karolinska Institutet, Stockholm. By reproducing aircraft accelerative forces and measuring their effects on the heart, blood circulation, and nervous system, protection for operational flying and various possible emergency situations will be made possible.

4234
Goldstein, M.
A PROFICIENCY MEASURE FOR TEMPORAL INTEGRATION OF COMPONENTS IN A PERCEPTUAL-MOTOR TASK. — Air Force Personnel and Training Research Center. Armament Systems Personnel Research Lab., Lowry Air Force Base, Colorado. Technical Note no. AFPTRC-TN-55-35, Nov. 1955. v+14 p. AD 102 045 PB 124820

The triggering component of the pedestal sight gunnery task poses a difficult problem in proficiency measurement. Skill is not reflected by sheer amount of triggering; it is rather a function of the extent to which moments of triggering are made to coincide with moments of accuracy in the other components. It is informative to measure triggering proficiency by means of the score, D, which compares the performance of the subject with expected results for a random automatic triggering device. The D score is liable to contaminating influences which may be removed by means of covariance analysis to yield a corrected score, D_e. This score allows the subject to choose his amount of triggering at will, so long as the integration of triggering with moments of accuracy in the other components is maximal. An experimental study of 64 subjects has demonstrated that D_e displays a reasonable amount of learning and is probably satisfactorily reliable. Learning and level of performance were not as good for a "burst control" group as for a nonburst group. (Author's summary)

4235
Goodyear Aircraft Corp.
INVESTIGATION OF CONTROL "FEEL" EFFECTS ON THE DYNAMICS OF A PILOTED AIRCRAFT SYSTEM. — Goodyear Aircraft Corp., Akron, Ohio (Contract NOas-54-244c); issued by Dept. of Navy. Bureau of Aeronautics, D. C. BUAER Report no. AE-61-10, April 25, 1955. iv+58 p. AD 87 846 PB 123710

Human operators performed a rate-control task (resembling control of pitch or roll attitudes of aircraft during critical phases, such as attack, landing, or formation flight) on a closed-loop flight simulator. A flight-simulator apparatus, an aerodynamic simulator, a random-wave generator, a dynamic mock-up, and a Geda analog computer circuit can be designed to simulate the control-stick motion of any given pilot. Manual adjustment of the simulator was considered sufficiently versatile to account for individual differences and for pilot adaptation to new situations. The simulator was sufficiently accurate that the Navy pilots could not detect its substitution for themselves. Pilot dither was found to be a significant part of output energy in the case of some jet interceptor pilots in a tight control task. It is suggested that no aircraft should be designed with low-pass aerodynamic response unless the reasons for pilot dither are understood and the exclusion of this feedback appears justified. (AD abstract, modified)

4236
Gordon, M. A.
IMPLICATIONS OF REGIONAL DIFFERENCES IN APTITUDE FOR PERSONNEL CLASSIFICATION. — Air Force Personnel and Training Research Center, Lackland Air Force Base, San Antonio, Texas. Research Report no. AFPTRC-TN-55-13, June 1955. vi+13 p. AD 72 588 PB 118608

The regressions of final school grade on the aptitude index were compared for the 6 Army enlistment areas for 3 samples of graduates of clerical and mechanical technical schools. Significant differences in the level of the regression line were found in 2 of the 3 samples, and a nearly significant difference was found in the third. The observed grade was better than the predicted grade (1) in areas with an initial cultural disadvantage on the aptitude tests or, more specifically, (2) in areas where scores on nonverbal tests were relatively better than scores on verbal tests, and (3) in areas where the ability to see general mechanical principles was relatively better than specific knowledge of mechanical tools. The greatest and most consistent differences were found between Area I (Northeast) and Area IV (South Central); the mean observed grade predicted on the basis of a given aptitude score was consistently low for Area I and consistently high for Area IV. (From the AD abstract)

4237
Goria, A.,
and L. Luria
[THE ELECTROCARDIOGRAM IN NORMAL PERSONS IN CONDITIONS OF ACUTE HYPOXIA] L'elettrocardiogramma nell'individuo normale in condizioni di ipossia acuta. — Minerva medica (Torino), 46 (21): 692-693. March 14, 1955. In Italian. DNLM

Electrocardiography was performed in subjects rendered hypoxic near sea level (Torino) by rebreathing a mixture of 7.5% oxygen in nitrogen, and at high altitudes (Col d'Olen, 3,000 meters, and Plateau Rosà, 3,500 meters) by rebreathing environmental air. An increase of approximately 80% in cardiac frequency was noted in all subjects at sea level. ECG changes occurred primarily in the PT, TP, PQ and ST intervals, and in the P wave. At high altitude changes were found in the PT and TP intervals and in the T wave. In both hypoxic groups an increase was found in the P wave by 20-50%, and a decrease in the T wave by 20-50%.

4238
Goria, A.
[ELECTROCARDIOGRAPHIC CHANGES DURING ACUTE HYPOXIA] Modificazioni elettrocardiografiche durante ipossia acuta. — Bollettino della Società italiana di biologia sperimentale (Napoli), 31 (1-2): 39-41. Jan.-Feb. 1955. In Italian. DNLM

Electrocardiographic recordings on subjects at Torino, Italy (altitude of 260 meters), rebreathing a mixture of 7.5% O_2 in N_2, and on subjects on a high mountain (Col d'Olen, Italy, altitude of 3000 meters) rebreathing environmental air demonstrated changes in the PT, TP, PQ, and ST intervals and P and T waves. At high altitude, anoxia induced a conspicuous reduction of the duration of the electrical diastole and moderate changes in electrical systole.

4239
Goria, A.,
and L. Luria
[THE WRITING TEST IN HYPOXIA IN MOUNTAIN CLIMBERS AND IN NORMAL SUBJECTS] La prova di scrittura in ipossia in alpinisti ed in soggetti normali. — Minerva medica (Torino), 46 (21): 690-691. March 14, 1955. In Italian. DNLM

The writing test was performed in alpine guides (16-24 years of age) and in normal subjects (24-30 years of age) rendered hypoxic by rebreathing environmental air in a closed circuit at high altitudes (Col d'Olen, 3000 meters or Plateau Rosà, 3,500 meters). Three periods were noted which corresponded to the degree of hypoxia: (1) a latent period in which no disturbances in writing occurred; (2) a phase characterized by primary changes; and (3) a critical phase manifested by a complete inability to write. Changes were observed first in the writing of numbers, especially of 7 and 8. Some subjects displayed a degree of uncertainty in writing and required more time to perform the task. Alpinists did not have writing changes due to muscular rigidity, but normal subjects had complete contracture of the forearm which persisted for a while after the cessation of hypoxia.

4240
Gottsdanker, R. M.
A FURTHER STUDY OF PREDICTION-MOTION. — Amer. Jour. Psychol., 68 (3): 432-437. Sept. 1955. DLC (BF1.A5, v. 68)

Adult human subjects were given the task of predictively continuing the tracking of a target which had been made to disappear from view. A pattern of constant rate and a positively accelerated pattern were included within each of three ranges of target-movement. In addition, an ordinary tracking task was given to provide a criterion of skill. The following results were obtained: (1) Previous results, showing the smoothing of accelerated patterns, relatively high accuracy on patterns of constant rate, and consistent individual differences, were corroborated. (2) For targets with similar patterns of acceleration, the ratio of continuative rate to terminal rate was fairly constant. (3) Relative accuracy increased slightly as the rate of the movement of the target increased. (4) No measure of prediction-motion provided a satisfactory forecast of skill in tracking. (Author's summary)

4241
Gowdey, C. W.,
and J. W. Pearce
A SELECTED BIBLIOGRAPHY OF THE OPEN LITERATURE ON AVIATION MEDICINE, 1945-1955. — Western Ontario Univ., Canada; issued by Defence Research Board (Canada). July 1955. x+59 p. [DRB Report no. DR-97]. AD 87 331 UNCLASSIFIED

A selected bibliography on aviation medicine is presented containing 724 references and covering the years 1945-1955. No references are included to technical and project reports. The following

topics have received special emphasis: air sickness; altitude effects, anoxia, and hypoxia; blood gases and respiratory physiology; decompression aeroembolism; explosive decompression, hyperventilation; negative and positive g; oxygen toxicity; pressure breathing; stress and fatigue; and vestibular apparatus.

4242
Graf, O.
[INVESTIGATION OF MENTAL FATIGUE AND NERVOUS STRESS: STUDIES OF THE 24-HOUR RHYTHM OF THE AUTONOMIC NERVOUS SYSTEM AT REST AND UNDER STRESS] Erforschung der geistigen Ermüdung und nervösen Belastung: Studien über die vegetative 24-Stunden-Rhythmik in Ruhe und unter Belastung. — Forschungsberichte des Wirtschafts- und Verkehrsministeriums Nordrhein-Westfalen, no. 113. Köln: Westdeutscher Verlag, 1955. 26+[14] p. In German. DNLM

This is a review of the experimental development of research methods for the observation of the diurnal rhythms in the activity of the autonomic nervous system and the effects of fatigue. The following indices were evaluated: (1) the electrodermal resistance to direct and alternating currents of low frequencies, (2) the skin elasticity, i.e. the tonus in the cutaneous and subcutaneous tissues, (3) the oxygen saturation of the blood in superficial skin capillaries, (4) critical flicker fusion test, and (5) auditory threshold for the upper frequency range. The skin resistance exhibited a characteristic curve over the 24-hour period which corresponded with that of physiological efficiency. Measurements of skin tonus and hearing threshold promised to be of some value.

4243
Gragg, D. B.,
D. J. Kieselbach, W. F. Murphy, R. E. Peckham, and H. Heller
THE 14-WEEK EXPLORATORY STUDY OF MARGINAL-AIRMAN BASIC TRAINING: COMPARISON OF PROFICIENCY OF 8-WEEK AND 14-WEEK TRAINING GROUPS. — Personnel Research Lab., Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-10, June 1955. vi+27 p. (Project no. 7700, Task no. 77003). AD 72 583
PB 118605

The performance was studied of two equivalent groups of 140 American-born marginal airmen below fifth grade school achievement. Marginal-ability airmen are those with percentile scores of 30 or below on the Armed Forces Qualification Test (AFQT). One group was given an experimental 14-week course of basic training; the other group was given the regular 8-week course. Except for difference in length of basic training courses, the curriculum, materials, and teaching methods were the same for both groups. The group of 280 airmen was divided into two equal groups by equating on the basis of the following variables: (1) the sum of the AFQT-1 raw score plus the Inter-American Test raw score; (2) the California Achievement total raw score; (3) education; (4) age; (5) cultural group; (6) occupation; (7) Army area of birth, and (8) Army area of enlistment. Results gave little support to an extension of the basic training period for low-level airmen, except possibly in the area of mathematics. (From the AD abstract)

4244
Grandjean, J.,
and R. M. Goody
THE CONCENTRATION OF CARBON DIOXIDE IN THE ATMOSPHERE OF MARS. — Astrophys. Jour., 121 (2): 548-552. March 1955.
DLC (QB1. A9, v. 121)

The fraction of carbon dioxide in the atmosphere of Mars was redetermined from previous observations of carbon dioxide bands in the spectrum of the planet, taking into account the fine structure of the band and the shape of the rotation lines. If the ground-level pressure on Mars is 100 millibars, the fraction by volume of carbon dioxide is shown to be 50 times greater than in the earth's atmosphere. (Authors' abstract, modified)

4245
Grandpierre, R.,
P. Grognot, and J. Chomé
[PHYSIOPATHOLOGICAL EFFECTS OF NOISE EMITTED BY AIRCRAFT ENGINES: MEANS OF PROTECTION TO BE USED] Effets physiopathologiques des bruits émis par les propulseurs d'avions: les moyens de protection a utiliser. — Technique et science aéronautiques (Paris), 1955 (3): 168-178. 1955. In French.
DLC (TL502.E3614, v. 1955)

Measurements of the spectrum of aircraft noise have shown that the intensity of noise emitted is greatest between 150 and 1200 c.p.s. and between 20,000 and 50,000 c.p.s. in piston aircraft, and around 5000 c.p.s. and between 20,000 and 50,000 c.p.s. in jet aircraft. The intensity and spectrum of noise from aircraft in flight varies with distance from the noise source, type of plane, number of planes, engine type, meteorological conditions, and type of vegetation on the ground. The principal physiopathological reactions to noise include auditory adaptation (temporary lowering of threshold), auditory fatigue (extended lowering of threshold), sensory excitation of the muscles and tendons (at low sonic frequencies), alterations in blood constituents, audiogenic seizures, and psychic disturbance. Measures of protection against the effects of noise include individual ear shielding and electronic absorption for acute noise exposure, and use of sheltering walls, vegetation, and soundproof rooms for inhabited areas neighboring airports. It is suggested that zoning restrictions be observed in the development of new airports. The suggested program would allocate zones with noise exposures of (1) over 88 db., for parks and gardens; (2) 80-88 db., for residences of airport employees, with soundproofed rooms; (3) 70-80 db., for construction of buildings other than homes, hospitals, or schools; and (4) below 70 db., for unlimited construction.

4246
Grandpierre, R.,
and P. Grognot
[THE PHYSIOPATHOLOGICAL EFFECTS OF VIBRATIONS TRANSMITTED BY AIR IN AVIATION: MEANS OF PROTECTION] Effets physiopathologiques des vibrations transmises par l'air en aviation: les moyens de protection. — Médecine aéronautique (Paris), 10 (4): 309-344. 1955. In French. DLC (TL555.M394, v. 10)

A discussion of the characteristics of aviation noise, its dangers, and the principal problems involved in the protection of personnel is presented.

The nature of sound emitted and the effects of wall thickness, speed of aircraft, location of personnel in the plane, meteorological conditions, and vegetation on the intensity of sound perceived are discussed. The physiological effect of high-intensity noise of varying frequencies, including modifications of muscle tone, cortical activity, blood, digestion, metabolism, endocrine system, and mental processes, and the symptoms observed, including headaches, neuralgia, asthenia, and irritability, are described. Differences in the effects of intermittent and continuous noise are considered. The protective measures are discussed of (a) ground personnel (by ear protectors, selection, and surveillance); (b) air personnel (by reduction of the noise source, soundproofing of the cabin, and individual protection); and (c) the inhabitants of the airport area.

4247
Grandpierre, R.,
L. Tabusse, and P. Bouverot
[MODIFICATIONS OF CARDIAC RHYTHM PROVOKED BY THE INHALATION OF OXYGEN] Modifications du rythme cardiaque provoquées par l'inhalation d'oxygène. — Journal de physiologie (Paris), 47 (1): 185-190. 1955. In French.
DLC (QP1.J7, v. 47)

The inhalation of 60-100% oxygen in nitrogen has been found to produce bradycardia in most humans after 15 minutes. Electrocardiographic studies have shown in most cases an increase in the T wave, a lengthening of the ventricular complex QRST, and a lengthening of the PQ distance. Bradycardia is rarely seen in dogs breathing even pure oxygen, but when it occurs, it is accompanied by electrocardiographic phenomena similar to those observed in humans.

4248
Grandpierre, R.,
C. Franck, and L. Tabusse
[PHARMACO-DYNAMIC SUBSTANCES THE USE OF WHICH IS CONTRA-INDICATED FOR FLIGHT PERSONNEL] Substances pharmaco-dynamique dont l'emploi est contre-indiqué pour le personnel navigant. — Force aérienne, Service de santé, Bulletin technique d'information [Bruxelles], 2 (2): 1-30. May 1955. In French. DNLM

Same as item no. 2831, vol. III.

4249
Grandpierre, R.,
and F. Violette
[VARIATIONS IN TOLERANCE TO PRESSURE BREATHING] Les variations de tolérance à la respiration en surpression. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 16-18. London: Butterworths Scientific Publications, 1955. In French. DLC (TL500.N6, no. 6)

The cardiovascular reaction to pressure breathing was found to be dependent in dogs on the size and rapidity of increases in pressure. Pressure changes less than 20 cm. H_2O produced a rapid rise and fall in blood pressure, followed by a gradual rise to a nearly normal level. With pressure changes greater than 20 cm. H_2O severe prolonged hypotension was observed. The reaction was less severe when the pressure change was gradual. Four types of reaction to pressure breathing were observed in human subjects, including prolonged hypotension, hypertension, transient hypotension, and no reaction. Individual variations in tolerance are attributed to differences in the compensatory activities of the cardiovascular system.

4250
Grant, D. A.,
N. F. Kaestner, and L. M. Schipper
AUTOCORRELATION ANALYSIS OF GROSS LEARNING SCORES. — Perceptual and Motor Skills, 5 (2): 53-63. June 1955.
DLC (BF311.P36, v. 5)

Exploratory autocorrelation analysis of learning experiments based on rotary pursuit performance led to the conclusion that this type of analysis is useful from the methodological standpoint and for making certain predictions.

4251
Grant, D. A.,
and N. F. Kaestner
CONSTANT VELOCITY TRACKING AS A FUNCTION OF SUBJECT'S HANDEDNESS AND THE RATE AND DIRECTION OF THE TARGET COURSE. — Jour. Exper. Psychol., 49 (3): 203-208. March 1955.
DLC (BF1.J6, v. 49)

The effect of handedness, target direction, and target speed in a unidimensional tracking task was investigated in a latin-square experiment. Twenty-four subjects were divided into four groups according to experience and handedness. The eight experimental conditions consisted of the factorial combinations of (a) right-to-left target motions versus left-to-right target motions, and (b) four target rates. There was a significant practice effect for all subjects. Tracking performance scores fell off linearly as a function of the target speed. Neither handedness nor target direction, singly, influenced the tracking measures, but they had a statistically significant effect in combination. The right-handed subjects tracked the right-to-left target better, while the left-handed subjects tracked the left-to-right targets better. This finding is interpreted in terms of superiority of pushing or thrusting movements as opposed to pulling motion. (From the authors' summary)

4252
Grant, J. D.
THE NAVY'S ATTACK ON PROBLEMS OF DELINQUENCY. — Off. Naval Research, Research Rev., 1955 (June): 1-4. DLC (Q180.U5A54, v. 1955)

The Navy is conducting a research program to predict and control delinquency by study of the nature, capacities, and attitudes of offenders. Attitude tests have been developed which successfully differentiate between confined and non-confined personnel and which predict successful restorees. The process of readjustment is being studied through a "Living Group" program in which delinquent men receive professional and group therapy within a small closed living unit.

4253
Grant, W. C.
THE INFLUENCE OF ANOXIA OF LACTATING RATS AND MICE ON BLOOD OF THEIR NORMAL OFFSPRING. — Blood, 10 (4): 334-340. April 1955. DNLM

Same as item no. 1480, vol. II.

4254
Gray, E. L.
APPETITE AND ACCLIMATIZATION TO HIGH ALTITUDE. — Military Med., 117 (5): 427-431. Nov. 1955. DLC (RD1.A7, v. 117)

A nutritional survey of troops in training at Camp Hale, Colorado (altitude range from 9,000 to 13,000 feet) revealed that the men did not consume enough calories to sustain body weight until acclimatization occurred. No evidence of anorexia was found and satiety was reached quickly. Caloric deficiency was largely carbohydrate in nature. The following concept is presented relating anoxia to body weight loss: if anoxia is a limiting factor in brain metabolism and the level of carbohydrate within the central nervous system is the controlling appetite factor, then the satiety signal to the hypothalamus is prematurely set off and weight loss ensues.

4255
Gray, G. W.
LIFE AT HIGH ALTITUDES. — Scient. American, 193 (6): 58-68. Dec. 1955. DLC (T1.S5, v. 193)

A description of the Institute of Andean Biology of the University of San Marcos, Peru, is based on a visit by the author to the Institute and on interviews with officials of the Institute. The Institute was established in 1928 to provide facilities for the study of the physiology of altitude adaptation and the effects of altitude on men adapted to sea level and to high altitudes. Observations by the research group of the phenomena of altitude adaptation are presented.

4256
Gray, R. F.
THE EFFECTS OF TONIC ELECTRICAL STIMULATION AS A MEANS OF COMBATING ADVERSE CIRCULATORY DISTURBANCES CAUSED BY ACCELERATION. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5501, Jan. 25, 1955. iii+14 p. AD 55 215 UNCLASSIFIED

Electrical stimulation which caused strong painful contractions of the muscles of the abdominal wall did not increase significantly the g-level at which the subject lost sight of peripheral lights during positive acceleration. Nor was there a significant increase in the g-level at which peripheral light loss occurred when the muscles of the thighs were contracted by the electrical current. Because of the low protection afforded and the high degree of subject discomfort, this method of protection against g-force is considered to be impractical. (Author's summary)

4257
Graybiel, A.
THE CARDIOVASCULAR SYSTEM IN AVIATION MEDICINE. — In: Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 113-129. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

A discussion is presented of the cardiovascular system, its physiology, and its relation to stresses encountered in flight (reduced atmospheric pressure, acceleration, noise, vibration, danger). The following procedures are outlined for the flyer's clinical cardiovascular examination: (1) obtaining a medical history; (2) physical examination; (3) electrocardiography; (4) X-ray; (5) other laboratory procedures, including ballistocardiography, and (6) diagnosis, prognosis, treatment and disposition. The specific cardiovascular problems encountered in aviation medicine include those related to the aviator's career (during the periods of selection, training, operation and command); heart murmurs; cardiac arrhythmias; hypertension and hypertensive heart disease; peripheral circulatory failure; orthostatic hypotension; orthostatic tachycardia; vasovagal syncope; coronary heart disease and aging. Mention is made of the problem of serial transportation of the cardiac patient.

4258
Graybiel, A.
THE ESTABLISHMENT OF A LONGITUDINAL STUDY OF THE MEDICAL AND PSYCHOLOGICAL ASPECTS OF THE U. S. NAVAL AVIATOR. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Anthropometry and human engineering, p. 90-103. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 5)

Study of the problems of the flier from the time of induction until separation from flying duty or from the service is essential to the development of sound student and officer selection procedures, training techniques, and protective measures. A proposed long-range program for the study of fliers consists of: (1) continuous centralized collection and coding of medical, psychological, and performance data, (2) improvement of the reliability of certain phases of the medical examination and definition of essential criteria, (3) introduction of objective measures whenever possible, (4) introduction of mass testing procedures, (5) collection of monthly reports by flight surgeons providing information on the nature of flying duty and cause of absence from duty, (7) use of a routine medical examination and complete periodic reevaluation, and (8) introduction of selection tests for prediction of leadership capacity and operational success.

4259
Graybiel, A.
FLYING STRESS AND HEART DISEASE IN NAVAL AVIATORS. — Jour. Aviation Med., 26 (4): 329-336. Aug. 1955. DLC (RC1050.A36, v. 26)

Same as item no. 2839, vol. III.

4260
Graybiel, A.
MEDICAL ASPECTS OF FLYING. — Merck Report 64 (3): 11-14. July 1955. DLC (RS1.M57, v. 6
Reprint also issued as: Naval School of Aviation Medicine, Pensacola, Fla. [Unnumbered Report], July 1955. [4] p. AD 116 428 UNCLASSIFIE

The medical problems of aerotransportation are discussed with reference to passengers who may experience anxiety, airsickness, or earache during flight, or if disabled or ill may find their conditions aggravated aloft. Mention is made of the initial selection and subsequent care of the air crew and of the problems incidental to successful flight operations such as prevention of transmission of communicable diseases. The medical aspects of military aviation are noted with emphasis on the selection and care of the flyer, fitness to his environment, and his escape and survival in case of accident.

4261
Grayson, J.,
and D. Mendel
TEMPERATURE RESPONSES IN RAT LIVER AND ABDOMEN FOLLOWING COLD EXPOSURE [Abstract]. — Jour. Physiol. (London), 129 (3). 63P-64P. Sept. 18, 1955. DLC (QP1.J75, v. 129)

Conscious rats restrained in tubes and placed in a refrigerator at 7.5° C. showed after 30 minutes a mean decrease of 1.7° C. in liver temperature and 2.5° C. in abdominal temperature. Bilateral adrenalectomy or administration of a ganglion-blocking agent (tetraethylammonium bromide) increased the temperature reaction to cold exposure in the liver but not in the abdomen. When nerve block was combined with adrenalectomy, liver and abdominal temperatures did not stabilize and after 1 1/2 hours had decreased by 5.3° C. and 6.2° C., respectively. Anesthetized rats showed after 35 minutes a similar decrease which was, however, greater and more rapid in the liver than in the abdomen, suggesting an anesthetic inhibition of liver metabolism.

4262
Greatrex, F. B.
JET NOISE. — Engineer (London), 200 (5188): 23-25; (5189): 45-47; (5190): 92-93. July 1, 8, and 15, 1955. DLC (TA1.E5, v. 200)
Also issued as: Inst. Aeronautical Sciences (New York), Preprint no. 559. 49 p. DLC (TL507.I55)

Detailed measurements are presented of the noise field around jet engines. Of the various noise reduction devices tested, the toothed nozzle was discarded owing to its adverse effect on engine performance. A series of corrugated nozzles having no effect on engine performance were found to give worthwhile noise reductions. The three main conditions under which jet noise affects the community are: (1) during the ground-running of engines (effectively silenced by a ground muffler); (2) from aircraft passing overhead during take-off and approach (noise is 9 decibels higher on take-off with standard jet engines than with propeller engines, but can be reduced to the same level with bypass-type engines and corrugated nozzles), and (3) inside the aircraft (controlled by aircraft design to avoid known high-intensity parts of the noise field).

4263
Green, B. F.,
and L. K. Anderson
SPEED AND ACCURACY OF READING POLAR COORDINATES ON A HORIZONTAL PLOTTING TABLE. — Jour. Applied Psychol., 39 (4): 227-236. Aug. 1955. DLC (BF1.J55, v. 39)

This study investigated the speed and accuracy of reading the range and azimuth of targets presented on six different polar-coordinate grids. The display was presented on a horizontal plotting table. The accuracy of coordinate reading appears to depend more on the size of the interval between successive range and azimuth indications than on the form of these indications. Small hatches were nearly as effective as complete lines extending across the grid. The accuracy of reading the azimuths of targets increased as the range of the target increased. However, if angular error is converted to linear-distance error, the azimuth readings are more accurate for shorter ranges. Gross errors were infrequent. Some grid designs tend to mask targets and thus to increase the time required to locate the target. The time required to report the target was approximately the same for all grids. (Authors' summary, modified)

4264
Green, B. F.,
and L. K. Anderson
THE TACTUAL IDENTIFICATION OF SHAPES FOR CODING SWITCH HANDLES. — Jour. Applied Psychol., 39 (4): 219-226. Aug. 1955. DLC (BF1.J55, v. 39)

Three experiments are reported concerning the tactual identification of 16 differently shaped lever-switch handles. Two methods for measuring confusion among shapes were used: (1) the find method in which the subject searches through a set to find a particular handle, and (2) the learn method in which the subject learns to associate a number with each of the 16 handles. There was a moderate agreement between both methods in identifying and measuring the extent of predominant confusions. Significantly fewer errors were made in the find method by subjects first tested on the learn method indicating familiarity with the stimuli to be an important factor. Different sizes of handles (1/4 in. diameter, 3/8 in. diameter) did not affect the speed of learning. Transfer from one size to the other was affected with few errors. The handles first learned tactually were identified visually with very few errors. (Authors' summary, modified)

4265
Green, R. F.,
J. Tomlinson, and S. D. S. Spragg
ACCURACY OF BISECTION OF LARGE ANGULAR EXTENTS IN VARIOUS PLANES OF MOVEMENT, USING A KNOB CONTROL. — Univ. of Rochester. Dept. of Psychology, New York. (Contract N6onr-241, T. O. 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-17, Aug. 1, 1955. 4 p. (SPECDEVCEN Project no. 20-M-1d). AD 109 239 UNCLASSIFIED

This study was designed to answer the question: are there important differences in the accuracy of making knob settings when the knobs are located in different planes and when the angular extent of the "dead" zone is relatively large? Blindfolded, right-handed, basic trainees (each served for only one of the angles tested in all of the planes) were used as subjects and required to make 36 settings on control knobs for either of five angles (40°, 70°, 100°, 130°, or 160°) within each of three planes (vertical transverse, or front; vertical in a sagittal plane, or

right side; and horizontal or top). For large angles (130° and 160°) knob setting by bisection of the angle is more accurate when the knob is in the frontal plane than on the top (horizontal plane) or on the right (sagittal plane). Since knob settings are large angles, and since such settings are performed best in the frontal plane, the authors suggest that where possible control knobs for tasks such as tuning and focusing be placed in the frontal plane and geared to the equipment in such a way that the setting involves bisection of a large angle (approximately 130°).

4266
Green, R. F.
ACCURACY OF SETTING CONTROL KNOBS AS FUNCTIONS OF DIRECTIONS OF FINAL MOVEMENT AND NUMBER OF SETTINGS. — Univ. of Rochester. Dept. of Psychology, New York (Contract N6onr-241, T. O. 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-15, Aug. 1, 1955. 7 p. (SPECDEVCEN Project no. 20-M-1d). AD 109 237 UNCLASSIFIED

Ninety-six righthanded, blindfolded Air Force basic trainees were given 52 test trials, attempting to bisect various angular extents on a control knob through "feel". The first 20 settings included 10 in which final movement was to the right (clockwise) and 10 to the left (counterclockwise), bisecting an 80° angle. There followed immediately 8 settings on each of the following conditions: final movement right to bisect a 40° angle; left 40°; right 120°; left 120°. Under most conditions, settings made to the left were more accurate than settings made to the right. For the number of trials used in this study (8-10), successive bisections of the same angle resulted in a progressively poorer mean performance—except when the setting was made to the left through a 120° angle. Accuracy of settings was found to vary according to how three factors (angle size, direction of final setting movement, and number of trials) were combined. Until the influence of time between settings is better known, the author suggests that if single settings are to be made with long time intervals between settings, the angle should be between 40° and 80° and the final movement should be to the left; if a series of closely spaced settings are to be made, it would be best to turn left half way through a 120° angle.

4267
Green, R. F.,
E. B. Norris, and S. D. S. Spragg
COMPENSATORY TRACKING PERFORMANCE (MODIFIED SAM TWO-HAND PURSUIT TEST) AS A FUNCTION OF THE DIRECTIONS AND PLANES OF MOVEMENT OF THE CONTROL CRANKS RELATIVE TO MOVEMENT OF THE TARGET. — Jour. Psychol., 40 (2): 411-420. Oct. 1955.
DLC (BF1.J76, v. 40)

The problem was to determine whether certain optimum display-control relationships which had previously been found for a following tracking task would also prove optimum for a compensatory task. Thirty-two male university undergraduates served as subjects. The subjects were divided into two groups, each group having the two control cranks arranged in a different combination of planes of rotation. Four combinations of directions of rotation (to produce the same effect on the target) were given to all 32 subjects. No reliable differences between any experimental conditions were obtained. Hence, for the task studied, it appears that in this respect compensatory tracking differs markedly from following tracking, in which optimum display-control movement relationships have been clearly identified. (Authors' summary)

4268
Green, R. F.,
E. B. Norris, and S. D. S. Spragg
THE EFFECT ON PERFORMANCE OF VARYING THE DIRECTIONS AND PLANES OF MOVEMENT OF THE CONTROL CRANKS ON A COMPENSATORY TRACKING TASK. — Univ. of Rochester, New York (Contract N6onr-241, T. O. 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report SPECDEVCEN 241-6-13, Aug. 1, 1955. 5 p. (SPECDEVCEN Project 20-M-1d). AD 109 240 UNCLASSIFIED

A study was undertaken to determine whether (1) the direction of rotation of the crank controls relative to the movement of the display and (2) the combination of planes in which the controls were rotated, which had been shown to be best for a complex 2-hand coordination tracking task would also prove to be best for a complex 2-hand compensatory tracking task. Only those display-control relationships were used that were considered best for the following tracking. The subjects were 32 male undergraduates of the University of Rochester; the apparatus was a modified SAM 2-hand pursuit test. Results indicated no reliable differences between any of the various display-control relationships. The following and compensatory tracking tasks differed markedly in that optimum display-control relationships could be identified for following tracking but not for compensatory tracking. (AD abstract)

4269
Green, R. F.,
D. R. Goodenough, B. G. Andreas, A. A. Gerall, and S. D. S. Spragg
THE EFFECTS OF PLANES OF ROTATION OF CONTROL CRANKS ON PERFORMANCE LEVELS AND TRANSFER EFFECTS IN COMPENSATORY AND FOLLOWING TRACKING. — Univ. of Rochester. Dept. of Psychology, New York (Contract N6onr-241, T. O. 6); issued by Office of Naval Research, Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-22, Aug. 1, 1955. 8 p. (SPECDEVCEN Project no. 20-M-1d). AD 109 354 UNCLASSIFIED

The transfer effects between two control-display tasks having partial or complete continuity for accomplishing compensatory and following tracking were investigated. Right-handed basic trainees at a military installation served as subjects; they were divided at random into 4 groups. Two groups of 20 each were tested on the compensatory-tracking task, and 2 groups of 21 each on the following-tracking task. A modified version of the 2-hand pursuit test was used. Complete continuity between control and display resulted in the greatest accuracy for compensatory tracking. There was greater transfer from the partial continuity task to the complete continuity task than from the complete to the partial. This superiority was not obtained with following track in which no reliable differences were obtained. There should be continuity between the planes of control and display movements. (From the AD abstract)

4270
Green, R. F.,
H. L. Zimiles, and S. D. S. Spragg
THE EFFECTS OF VARYING DEGREES OF KNOWLEDGE OF RESULTS ON KNOB SETTING PERFORMANCE. — Univ. of Rochester. Dept of Psychology, New York (Contract N6onr-241, T. O. 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-20, Aug. 1, 1955. 5 p. (SPECDEVCEN Project no. 20-M-1d). AD 109 352 UNCLASSIFIED

The effect of giving different kinds, or degrees of specificity, of knowledge of results on the accuracy of bisection of an angular extent with a knob was studied. Mechanical stops on the apparatus were used to define the angle being bisected. The subjects were 90 randomly selected basic trainees who had been in the military service only 7 days, all right-handed. The subjects wore a pair of goggles with covered lens to eliminate visual information from the knob. Limited knowledge and exact knowledge of results resulted in increased accuracy of knob setting for a group of individuals. The accuracy of setting by one person was not improved. (AD Abstract)

4271
Green, R. F.
THE EFFECTS ON PERFORMANCE OF A COMPENSATORY TRACKING TASK OF INTERCHANGING THE CONTROL OF THE AXES OF MOVEMENT BETWEEN THE HANDS. — Univ. of Rochester, New York (Contract N6onr-241, T. O. 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-23, Aug. 1, 1955. 6 p. (SPECDEVCEN Project 20-M-1d). AD 110 963 UNCLASSIFIED

An investigation was made on the effect of the transfer of the control of each dimension of a two-dimensional compensatory tracking task to the opposite hand. The effect produced by interchanging the axis of the display controlled by each control ranged from very small to very large. The training value which transferred from one display-control relationship to another was soon lost. It is suggested that since interference generally results from interchanging the axes of a control-display relationship, it would be better to select an optimum arrangement and use it consistently. (Author's foreword, modified)

4272
Green, R. F.,
B. G. Andreas, E. B. Norris, and S. D. S. Spragg
PERFORMANCE ON A FOLLOWING TRACKING TASK (THE SAM TWO-HAND COORDINATION TEST) AS A FUNCTION OF THE CONTINUITY OF THE PLANE AND DIRECTION OF MOVEMENT OF THE CONTROL CRANKS AND TARGET FOLLOWER. — Jour. Psychol., 40 (2): 403-410. Oct. 1955. DLC (BF1.J67, v. 40)

The role of continuity between the respective directions of movement of the controls and controlled member of a display in following tracking—a complex perceptual-motor task—was investigated by means of a modified SAM Two-Hand Coordination Test. Two groups of subjects performed a series of trials on each of two display-control arrangements, one with the location of the cranks resulting in optimum performance and the other in poor performance. By changing electrical connections between display and controls, spatial "continuity" was produced for the "poor" crank location. Performance on the crank location which had been among the poorest became essentially equal to performance on the best. It is clear that ease of learning and performance on a perceptual-motor task requiring continuous adjustment of crank controls will be best whenever display and controls can be so arranged that the display-control movement relationships are in the "natural" or expected directions, and also that there is continuity between the planes of control movement and the axis of follower movement. This principle seems to be more important as a determiner of performance than is the absolute position of the control cranks. (Authors' summary, modified)

4273
Greenfield, A. D. M.
THE RESPONSE TO COLD IN THE RANGE 0-10° C. — In: Peripheral circulation in man, p. 105-114. Ed. by G. E. W. Wolstenholme, and J. S. Freeman. (Ciba Foundation Symposium.) Boston: Little, Brown and Co., 1954. DLC (QP101. C52)

The experiments discussed deal with quantitative studies of the response to cold of the digital blood vessels. The method of venous occlusion plethysmography was tried but discarded in favor of calorimetry. The initial effect of immersion is vasoconstriction followed by rapid vasodilatation with subsequent irregular episodes of constriction. The cold response is thought to be mediated by chemical rather than neural mechanisms.

4274
Greenhill, L. P.
THE EVALUATION OF INSTRUCTIONAL FILMS BY A TRAINED PANEL USING A FILM ANALYSIS FORM. — Pennsylvania State Univ., University Park (Contract N6onr-269); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 269-7-57, Sept. 20, 1955. 68 p. (SPECDEVCEN Project 20-E-4). AD 80 956 PB 123 750

Research was conducted to develop a film-analysis form, and to train a panel to make reliable and valid judgments concerning the effectiveness of using the film-analysis form. The procedure is intended particularly for the preproduction and prerelease evaluation of films, but it is also applicable to the evaluation of completed films. The study relates principally to films designed to teach performance skills, or facts and principles, rather than films which have attitude structuring as their principal objective. Film analysis form F was developed for use by trained film production personnel. Trainee evaluation form A was developed for evaluation by trainees while the film is in the final production stages. A high degree of correspondence was obtained between the prediction of the teaching effectiveness obtained with the two forms. (AD abstract)

4275
Grether, W. F.
INSTRUMENT DIALS, INSTRUMENT ARRANGE-

MENT AND COCKPIT DESIGN. — In: North Atlantic Treaty Organization, Anthropometry and human engineering, p. 47-62. London, Butterworths Scientific Publications, 1955.
DLC (TL500.N6, no. 5)

Selected problems are discussed to illustrate how the U. S. Air Force applies research data on the sensory, motor, and psychological requirements of pilots to the engineering design of cockpits and cockpit equipment. Design problems considered are: (1) visibility of instrument markings, (2) selection of basic instrument type according to method of use, (3) control-instrument movement relationships, (4) design and arrangement of engine instruments for ease of check reading, (5) arrangement of basic instruments, (6) standardization of design, location, and method of actuation of controls, and (7) warning lights.

4276
Grice, G. R.
DISCRIMINATION REACTION TIME AS A FUNCTION OF ANXIETY AND INTELLIGENCE. — Jour. Abnormal and Social Psychol., 50 (1): 71-74. Jan. 1955.
DLC (RC321.J7, v. 50)

As subjects were selected 60 airmen comprising the upper and lower ten per cent anxiety scores of a random group of airmen basic trainees who filled out a revised Taylor Manifest Anxiety Scale. Both the high-anxiety and low-anxiety groups were given a complex discrimination-reaction-time task involving a high degree of interference. While the low-anxiety group was superior in performance on the reaction-time task, it was found that this superiority could be attributed to intellectual differences rather than to differences in the level of anxiety. (Author's summary, modified)

4277
Grinsted, A. D.
AVIATION PSYCHOLOGY. — In: Bureau of Medicine and Surgery, Aviation medicine practice, p. 131-144. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955.
DLC (RC1062.U52)

A review is presented of the history and nature of aviation psychology. Included is a condensation of Chapter VI of Naval Leadership, Book 2 (Psychology for Naval Leaders. Washington, 1948), which deals with the psychological program used for the selection and classification of naval flight personnel. A brief description is given of two naval aviation selection tests, the aviation qualification test and the flight aptitude rating.

4278
Grinsted, A. D.
THE PSYCHOLOGY OF ADJUSTMENT. — In: Bureau of Medicine and Surgery, Aviation medicine practice, p. 49-80. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955.
DLC (RC1062.U52)

This is chiefly a condensation of Chapters I, III, and IV of Naval Leadership, Book 2 (Psychology for Naval Leaders. Washington, 1948). Reviewed are need-constructs, and the nature of and reactions to conflict and frustration. The medical officer's role with respect to abnormal behavior is to recognize it, see that it receives treatment, and to maintain an objective attitude toward mental illness.

A combined shoulder and lap safety belt is described which provides comfortable double protection by an integral restraint device comprising only two strap elements.

4279
Griswold, R. W.,
and H. DeHaven
COMBINATION SHOULDER AND LAP SAFETY BELTS. — Elizabeth M. Griswold, Griswold Co., Old Lyme, Conn. U. S. Patent 2,710,649. June 14, 1955. 5 leaves. DP

4280
Grognot, P.,
and J. Valty
[ELECTRONIC SOUND ABSORBER] Absorbeur électronique de son. — Médecine aéronautique (Paris), 10 (4): 521-522. 1955. In French.
DLC (TL555.M394, v. 10)

An electronic system for the absorption of sound at low frequencies by the emission of sound at the same frequency but at exactly opposite phase is described. The apparatus reduces sound from 20 to 22 db. for frequencies of 150 to 200 c.p.s., but only for a limited frequency band and only within a 30 cm. diameter.

4281
Grognot, P.,
and J. Chome
[ACTION OF HISTAMINE AND ANTIHISTAMINICS ON PULMONARY LESIONS CAUSED BY THE INHALATION OF PURE OXYGEN IN THE RAT AND GUINEA PIG] Action de l'histamine et des antihistaminiques sur les lésions pulmonaires dues à l'inhalation de l'oxygène pur chez le Rat et le Cobaye. — Comptes rendus de la Société de biologie (Paris), 149 (5-6): 562-564. March 1955. In French. DLC (QP1.S7, v. 149)

Rats and guinea pigs were given histamine or various antihistaminics intramuscularly immediately before, and four hours after, initiation of a six-hour exposure to an atmosphere of pure oxygen. The pulmonary lesions occurring typically during prolonged oxygen breathing were exaggerated by the injection of histamine. The administration of the antihistaminics phenergan, neo-antergan, and multergan apparently protected rats against the appearance of lesions, but had no effect on guinea pigs.

4282
Grognot, P.,
J. Chome, and R. Senelar
[EXPERIMENTAL STUDY OF THE HISTOLOGICAL REACTIONS OF THE LUNG IN HYPEROXIA (STUDY ON LABORATORY ANIMALS)] Étude expérimentale des réactions histologiques du poumon dans hyperoxie (étude sur animaux de laboratoire). — Anesthésie et analgésie (Paris), 12 (5): 900-913. Dec. 1955. In French, with English summary (p. 911). DNLM

Pulmonary lesions were histologically demonstrated in rats and guinea pigs breathing pure oxygen for six hours. Animals breathing an 80% oxygen mixture exhibited pulmonary lesions after eight hours of continuous inhalation. Only one third of the animals breathing 45%-60% oxygen mixtures displayed any lesions after eight hours. It was noted that the administration of tetraethylammonium and chlorpromazine exerted a protective action against the formation of pulmonary lesions in these animals. (Authors' summary, modified)

4283
Grognot, P.,
and J. Chome
[EARLY HISTOLOGIC REACTIONS IN THE LUNG AFTER INHALATION OF PURE OXYGEN AT ATMOSPHERIC PRESSURE] Réactions histologiques précoces du poumon après inhalation d'oxygène pur à la pression atmospherique. — Médecine aéronautique (Paris), 10 (1): 65-77. 1955. In French.
DLC (TL555.M394, v.10)

The lungs of guinea pigs which had inhaled oxygen at atmospheric pressure for 1 1/2 to 3 hours showed only minor congestive changes. After 3 hours of oxygen breathing, the lungs were spotted with lesions consisting of congestion of all alveolar blood vessels, small capillary hemorrhages, thickening of the alveolar walls, swelling and vacuolation of the cytoplasm, and enlargement and turgescence of the nuclei. The lesions increased in intensity during exposure from 3 to 6 hours, and thereafter (up to 11 hours) spread progressively to large areas of the lung. After 24 hours of relief, congestion had largely disappeared, while cellular modifications disappeared only after 60 hours of relief. The lungs of animals inhaling oxygen for 2 or 3 periods of 7-8 hours with intervals of 24 or 48 hours of relief between exposures showed typical cellular, but not congestive, modifications. Although application of these results to human reactions is premature, it is suggested that the inhalation of pure oxygen for extended periods be alternated with periods of relief.

4284
Gross, N. B.
CORTICAL TRANSMISSION OF AUDITORY STIMULI. — In: Office of Naval Research, Symposium on physiological psychology, p. 215-228. ONR Symposium Report ACR-1, March 10-11, 1955.
AD 80 100 UNCLASSIFIED

The anatomical and electrophysiological studies which relate to the problem of the transmission of acoustic information after it has reached the cortex, are reviewed for the cat, "the monkey", and the chimpanzee.

4285
GROUND INSTRUMENT CHECKOUTS. — Canad. Aviation (Toronto), 28 (8): 44. Aug. 1955.
DLC (TL501.C33, v. 28)

A new flight trainer has been developed for the Department of Transport (Canada) for use in maintaining efficiency among departmental pilots and flight inspectors. The trainer, which is a modification of the American Link trainer, provides normal flight and engine controls, and reproduces pitch and bank by movement upon its base.

4286
GROUND TRAINERS BY AIR TRAINERS. — Aircraft (Toronto), 17 (8): 20-22. Aug. 1955.
DLC (TL501.A56143, v. 17)

The economical AT-100 dual-control instrument-flight trainer is described. The trainer provides normal flight and engine controls and simulates pitching and banking by movement upon its base.

4287
Gurdjian, E. S.,
J. E. Webster, and H. R. Lissner
MECHANISM OF BRAIN CONCUSSION, CONTUSION AND LACERATION [Abstract]. — Electroencephalography and Clinical Neurophysiol. (Montreal), 7 (3): 495. Aug. 1955. DNLM

Acceleration and intracranial pressure at the time of head impact were studied in experimental animals. Both the level of increase in intracranial pressure and its duration correlated with the physiological responses. When the level of intracranial pressure increase was held constant, it was possible to obtain serious, moderate, minimal, or no effects by varying the duration of the increase. Brain concussion is an involvement of the upper brain stem areas by microscopic changes in the cells due to pressure gradients present at the craniospinal junction following impact. Contusion and laceration of brain tissue following impact are caused by deformation of the skull, mass movements of the brain, distortions of the skull and dural septa, and shears with or without associated increase in intracranial pressure at the time of impact, and by cavitation.

4288
Gvatua, N. A.
[TECHNIQUE OF LOW OXYGEN-AIR MIXTURE FOR ELECTROCARDIOGRAPHIC DETECTION OF LATENT CORONARY INSUFFICIENCY] Vliianie skrytoĭ koronarnoĭ nedostatochnosti elektrokardiograficheskim metodom pri nagruzke smes'iu bednoĭ kislorodom. — Terapevticheskiĭ arkhiv (Moskva), 27 (7): 34-40. 1955. In Russian.
DLC (RM1.T35, v. 27)

The anoxia test as a possible aid in the detection of latent coronary insufficiency caused the patients some discomfort, but did not endanger them. However, the results failed to point to any worthwhile promise that the test procedure as employed was of any value as an auxiliary in the diagnosis of coronary insufficiency.

4289
Haas, W. R.
ANTI-MALARIAL DRUGS IN FLYING PERSONNEL. — Jour. Aviation Med., 26 (1): 20-23. Feb. 1955.
DLC (RC1050.A36, v. 26)

The antimalarial drugs, Chloroquine (SN 7618) and Primaquine (SN 13272) are discussed in relation to their effectiveness in the prophylaxis and treatment of malaria, and to the importance of side effects which might have a deleterious action

on flying personnel. The author reviews recent investigations into this problem, and concludes that there is no evidence that these drugs are sufficiently toxic to contraindicate their administration to flying personnel under controlled conditions.

4290
Haddad, B. F.,
H. R. Lissner, J. E. Webster, and E. S. Gurdjian
EXPERIMENTAL CONCUSSION: RELATION OF ACCELERATION TO PHYSIOLOGIC EFFECT. — Neurology, 5 (11): 798-800. Nov. 1955.
DLC (RC321.A47, v. 5)

The relationship between acceleration of the head due to a blow and resultant concussive effect was investigated in 34 anesthetized dogs. The duration and magnitude of acceleration (72-780 g) were measured by accelerometer secured to the skull opposite the side receiving the blow. Blood pressure and respiration were recorded. A concussive effect was indicated by a steep rise in blood pressure with respiratory arrest lasting several seconds immediately after impact. No constant relationship was obtained between the magnitude of acceleration and the physiologic response to it.

4291
Hafstrom, J. R. 1954
HUMAN ENGINEERING IN AVIATION ELECTRONICS. — In: Airborne electronics digest, 1954 (National Conference on Airborne Electronics, Dayton, 1954), p. 117-118. DLC (TL693.A3, 1954)

The functions of the human engineer in the design of electronic equipment are aimed at achieving the best over-all results from a man-machine system. Human engineering in aviation electronics is applied chiefly to the design of visual displays, the design of manual controls, the division of operator responsibilities and duties, and the determination of the range and also the limitations of human capabilities. A wider utilization of human engineers in the field of engineering is foreseen for the future.

4292
Hake, H. W.,
and C. W. Eriksen
EFFECT OF NUMBER OF PERMISSIBLE RESPONSE CATEGORIES ON LEARNING OF A CONSTANT NUMBER OF VISUAL STIMULI. — Jour. Exper. Psychol., 50 (3): 161-167. Sept. 1955.
DLC (BF1.J6, v. 50)

Same as the report, item no. 2869, vol. III.

4293
Hake, H. W.,
and C. W. Eriksen
RECOGNITION AND IDENTIFICATION OF COMPLEX VISUAL FORMS AS A FUNCTION OF THE LABELING SYSTEM EMPLOYED. — Johns Hopkins Univ., Baltimore, Md. (Contract AF 33 (038)-22642); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-367, Sept. 1955. iv+23 p. (Project no. 7192, Task no. 71598). AD 99 519 PB 121358

This report describes two experiments conducted to explore variables affecting the ability of human observers to learn to recognize and identify previously unfamiliar complex visual forms. In both experiments the effect upon subsequent recognition skill of giving subjects practice in the use of irrelevant labels as discriminating responses before they learned to associate them with a set of unfamiliar stimulus forms was systematically studied. The results suggested that labeling practice can have a double function. It can have the function first of forcing subjects to differentiate a set of stimulus forms, and can provide also a denotative process whereby subjects organize and identify the stimulus aspects differentiated by practice. This latter process occurs only with the use of larger sets of labels following practice in their use as identifying responses. The denotative use of labels appeared to have one possible concomitant deleterious effect. Subjects who had learned to associate practiced labels with a set of nonsense forms were significantly more willing, following each practice, to accept as familiar new forms of similar construction. That is, they showed significantly less accuracy in rejecting forms which were similar to those labeled in practice but not identical to any of them. (Authors' abstract)

4294
Halberg, F.
[EXPERIMENTS ON THE PHYSIOLOGY OF THE ADRENAL CYCLE] Experimentelles zur Physiologie des Nebennierenzyklus. — Acta medica scandinavica (Stockholm), Suppl. 307: 117-118. 1955. In German. DNLM

The diurnal rhythm of the eosinophile count was taken as an index of the phases of an adrenal cycle. The diurnal variation of eosinophiles is absent after adrenalectomy: it may be reinstated by administration of adrenal hormones. This is taken as a proof for the existence of an adrenal cycle, which is an endocrine mechanism of the diurnal periodicity. Changes of the vaginal mucosa indicated the phases of the sexual cycle. The light-dark changes in the environment are the principal synchronizing factors for the functioning of the adrenal cycle under physiological conditions. The role of the eyes as transmitters of synchronizing information has been established in mice. Similarities and differences in the adrenal and sexual cycles are discussed.

4295
Halbouty, M. R.,
and J. J. Heisler
SEVERE NEUROCIRCULATORY COLLAPSE AT SIMULATED ALTITUDE. — U. S. Armed Forces Med. Jour., 6 (9): 1363-1370. Sept. 1955.
DLC (RC970.U7, v. 6)

A case of neurocirculatory collapse (as manifested by motor and sensory disorders, visual and cardiac abnormalities, hyper- and hypothermia, vomiting, restlessness) is reported during chamber ascent at a rate of 1,000 feet to 3,000 feet per minute until a simulated altitude of 43,000 feet was reached. Therapy consisted primarily of close observation and conservative medical care; however two spinal punctures and a tracheotomy were

performed. Following this incident all trainees were provided with a combined physical examination-questionnaire form prior to chamber ascents. A considerable reduction in the number of chamber reactions was noted and no serious reactions occurred during simulated flights in the 14 months since use of this form was initiated.

4296
Haldane, J. B. S.
CLEARING THE AIR—2. — Jour. Brit. Interplanetary Soc. (London), 14 (5): 293-295. Sept.-Oct. 1955. DLC (TL790.A1B7, v. 14)

The author defends 3% CO_2 per volume in the air as a harmless concentration for the space-cabin atmosphere (see items no. 3875 and 4297) Man at rest has approximately 6% CO_2 in the alveolar air. This level is maintained by regulating the volume of air breathed per minute. As the CO_2 level in the inspired air is increased the volume per minute increases. Changes in blood and kidney function are viewed as compensatory reactions. Inactivity and a short time of exposure further reduce the possibility of any ill effects for the astronaut.

4297
Haldane, J. B. S.
THE PURIFICATION OF AIR DURING SPACE TRAVEL. — Jour. Brit. Interplanetary Soc. (London), 14 (2): 87-89. March-April 1955 DLC (TL790.A1B7, v. 14)

The value of 0.3% CO_2 per volume of air is disputed as the maximum permissible concentration in the atmosphere of a space cabin. The author maintains that a 3% CO_2 concentration is physiologically acceptable and permits a more efficient utilization of the absorbent. He cites his own experiences as a subject in tests of the submarine atmosphere, where a 48-hour stay in an atmosphere with up to 3% CO_2 concentration did not have any ill effects. (See also item no. 3875)

4298
Halhuber, M.
[AIR TRAVEL IN CARDIOVASCULAR PATIENTS]
Luftreisen von Kreislaufkranken. — Medizinische Klinik (München), 50 (50): 2133. Dec. 16, 1955. In German. DNLM

Statistical analysis of the incidence of cardiac fatalities during air travel shows that the danger to cardiac patients is low and is dependent, particularly in patients with restrictive cardiac disorders, upon conditions of flight such as length of flight, altitude, and weather. The chief advantages of flight as a means of travel for cardiac patients are the speed of flying and the availability of attendant care.

4299
Hall, A. L.,
and C. H. Maag
EVALUATION OF AN INSTRUMENTAL CONDITIONING PROCEDURE AS AN INDEX OF AUDITORY DECREMENT IN THE WHITE RAT. — In: Research notes from the Aviation Psychol. Lab., p. 12-15. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 101 105.02, March 15, 1955. AD 74 676 UNCLASSIFIED

A study was made of the use of a conditioned response as an index of auditory damage resulting from explosive decompression. Rats were conditioned to a stimulus tone which was followed by presentation of an electric shock. The escape response consisted of jumping from the charged cage floor to an uncharged perch. Response latency was found to increase after exposure to an explosive decompression from 0 to 60,000 ft. The conditioning procedure was not considered a satisfactory method for measurement of auditory damage, since the observed increase in response latency may have resulted from impaired movement rather than auditory damage.

4300
Hall, A. L.
SOME EFFECTS OF EXPLOSIVE DECOMPRESSION ON ALBINO RATS: PRELIMINARY STUDIES. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 10, 1955. v+[63] p. (Project no. NM 001 101 105.01). AD 77 746 UNCLASSIFIED

Albino rats were explosively decompressed over various rates of times and ranges of pressure. Rats decompressed slowly were used as controls. Explosive decompression per se produced damage most apparent in the pulmonary system. Some instances of damage to the gastrointestinal tract, ears, and diaphragm were noted. Explosive decompressions repeated after a short time interval were more lethal than if a period of recuperation was allowed between exposures. (Author's abstract)

4301
Hall, A. L.
SOME EFFECTS OF RAPID DECOMPRESSION TO 43,000 FEET ON HUMAN SUBJECTS: INCIDENCE AND SEVERITY OF AEREBULLOSIS (AEROEMBOLISM) IN A SUBJECT REPEATEDLY EXPOSED TO TERMINAL ALTITUDES BETWEEN 35,000 AND 43,000 FEET. — Naval School of Aviation Medicine, Pensacola, Fla. Dec. 28, 1955. iii+[20] p. (Research Project no. NM 001 101 103, Report no. 1). AD 96 379 UNCLASSIFIED

A human subject was exposed to simulated altitudes of 35,000 to 43,000 feet by rapid decompression for a total of 142 exposures. The man exhibited an increase both in severity and incidence of symptoms of aerebullosis (aeroembolism) with repeated exposure. As the number of exposures increased, the man had to be returned to increasingly lower altitudes before symptoms disappeared. Increase in number of exposures did not decrease the time at altitude for first appearance of symptoms. (Author's abstract)

4302
Hall, C. E.,
F. B. Engley, and T. Panos
THE EFFECT OF EXPOSURE TO HIGH ENVIRONMENTAL TEMPERATURES ON SUBSEQUENT INFECTION. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-68, Oct. 1955. 10 p. AD 95 146 UNCLASSIFIED

The exposure of rats to environmental temperatures of 100° F. for an indefinite period resulted in

an 87% mortality within two weeks. A marked decline was noted in the level of circulating eosinophils in rats exposed to this temperature for 24 hours. Heat of this degree applied for 24 and 48 hours, or 13 days did not sensitize the animals to a subsequent infection with Diplococcus pneumoniae. At 7 days of exposure a positive sensitization was indicated. At a temperature of 110° F., rats died at approximately 45 minutes and all were dead within 2 hours. A 30-minute exposure caused a marked decline in circulating eosinophils, but did not sensitize the animals to a subsequent infection with D. pneumoniae. A temperature of 140° F. was fatal to rats within 45 minutes. A single 5-minute exposure at this temperature or three such exposures on successive days failed to sensitize to subsequent infection. Thymic atrophy was found to be a more reliable index of adrenal hypersecretion when heat was used as a stressor. (Authors' summary, modified)

4303
Hall, J. F.,
and J. Polte
EFFECT OF WATER CONTENT AND COMPRESSION ON THERMAL INSULATION OF CLOTHING. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-356, Oct. 1955. v+22 p. (Project no. 7155, Task no. 71804). AD 99 563
UNCLASSIFIED

The effects of water compression (resulting from immersion to the neck level), simulated water leakage, and sweat accumulation upon thermal insulation of a typical Air Force protective clothing assembly were determined in a series of 55 experiments conducted with a copper manikin. Results of a series of tests on the effect of simulated sweat on thermal insulation of footwear (sock) are also included. Insulation loss due to hydrostatic compression and removal of the ambient air insulation (I_a) was significant, amounting to 56.8%; addition of water in quantities ranging from 100 to 1000 g./m.^{2} caused further reduction of thermal insulation, reaching a total of 77.6% at 1000 g./m.^{2}. Percentage loss of thermal insulation with increasing water content whether simulating leakage (measurements in water) or sweat accumulation (measurements in air) was similar. Comparable effects of water upon the thermal insulation of footwear were also observed in a series of 12 tests conducted on a copper thermal foot. On the basis of a total body heat storage loss of 50 Cal./m.^{2}/hr., predictive curves for human tolerance time in water of 0° C. as functions of clothing water content, metabolic level, and thermal insulation are presented. Measured heat loss of the clothed manikin in water was 2.3 to 4.0 times greater than in air, depending upon whether clothing was dry or maximally wetted (1000 g./m.^{2}). (Authors' abstract)

4304
Hallet, B. E.
EFFECT OF DECREASED BODY TEMPERATURE ON LIVER FUNCTION AND SPLANCHNIC BLOOD FLOW IN DOGS. — Surgical Forum, 5 (Proc. Forum Sessions, Clinical Congress of the Amer. Coll. of Surgeons, 40th (Atlantic City, N. J., 1954)), p. 362-365. DNLM (W1.AM338)

Splanchnic blood flow in hypothermic dogs appeared to decrease in arithmetic progression with the decrease in body temperature. At 23° C. splanchnic blood flow was approximately 22% of the normothermic values. Liver function tests performed before and after the induction of hypothermia did not demonstrate significant deleterious effects related to cold. Liver function appeared to be quantitatively decreased during the actual phase of hypothermia. (From the author's summary)

4305
Halpin, A. W.
THE LEADERSHIP IDEOLOGY OF AIRCRAFT COMMANDERS. — Jour. Applied Psychol., 39 (2): 82-84. April 1955. DLC (BF1.J55, v. 39)

The Leader Behavior Description Questionnaire was administered to 132 aircraft commanders with instructions to indicate their belief how they should behave as leaders. The above questionnaire was also administered to 1,103 crew members with instructions to describe the above commanders. In general, the evidence suggests that the aircraft commander's concept of how he should behave as a leader is not highly associated with his behavior as the crew perceives it.

4306
Halstead, B. W.
RECOMMENDATIONS FOR THE USAF SURVIVAL RESEARCH PROGRAM WITH REFERENCE TO MARINE BIOLOGICAL HAZARDS. — In: Needed survival research, p. 10-15. Ed. by E. G. Pattishall. George Washington Univ., Washington, D. C. (Contract AF 18(600)-1180). Technical Report, Nov. 1955. DNLM

Recommendations for the implementation of a program designed to combat the hazards of marine biology include: (1) encouragement of fundamental laboratory and field research in the epidemiology, biology, and ecology of venomous, poisonous, and traumogenous marine animals, taxonomic diagnosis, and causative disease agents; (2) establishment of courses of survival instruction for flight surgeons and provision of technical data to troops on a graduated basis; and (3) construction of field research facilities, particularly at Jaluit Island, Marshall Islands, or at Palmyra Island, Line Islands.

4307
Halstead, B. W.,
and K. G. Neal
RECOMMENDATIONS FOR THE USAF SURVIVAL RESEARCH PROGRAM WITH REFERENCE TO PLANTS. — IN: Needed survival research, p. 16-19. Ed. by. E. G. Pattishall. George Washington Univ., Washington, D. C. (Contract AF 18(600)-1180). Technical Report, Nov. 1955. DNLM

Projects recommended for the implementation of a survival program of utilization of edible plants and protection against toxic plants include: (1) compilation of a master check-list of toxic and edible plants on a world-wide basis by review of all available botanical literature; (2) compilation of current information derived from field work; (3) classification and characterization of significant plants; (4) toxicological screening of plant products; (5) provision of adequate logistics support to field surveys and establishment of compilation and field research centers; and (6) preparation of a motion picture program for survival training.

4308
Hamburger, R. J.
[THE SIGNIFICANCE OF VARIANTS OF THE HEMOGLOBIN MOLECULE IN AVIATION MEDICINE] De betekenis van variaties in het haemoglobine molecule voor de luchtvaartgeneeskunde. — Aeromedica acta (Soesterberg, Netherlands), 4: 165-171. 1955. In Dutch, with English summary (p. 170-171). DNLM

Electrophoretic study of hemoglobin solutions indicates that hemoglobinopathy is an important factor in hemolytic anemias, particularly sickle-cell anemia. At present four combinations of sickle-cell hemoglobin with other abnormal hemoglobins have been uncovered, all of which are sensitive to lowered oxygen tension. Under hypoxic conditions increase in the viscosity of blood and decreasing solubility of the S hemoglobin leads to overt symptoms of sickle-cell anemia, particularly infarcts of the spleen. Recent cases of splenic infarcts and other symptomology in sickle-trait carriers during high-altitude flights are reviewed. People with sickle-cells present in the peripheral blood are advised against flight. However, if air travel cannot be avoided, the airplane should have ample supply of oxygen for use at the appearance of the first symptoms, or for prophylatic inhalations at certain intervals. The presence of S hemoglobin, as determined by the provocation test in vitro, followed by an electrophoretic examination if the results were negative, should disqualify the bearer for any flying position in civil or military aviation.

4309
Hamburger, R. J.
EXTRACT OF LICORICE IN HYPOXIA. — Aeromedica acta (Soesterberg, Netherlands), 4: 120-126. 1955. In English. DNLM

The extract of licorice increases resistance to hypoxic convulsions in rabbits subjected to severe acute hypoxia. Flattening of the T wave in the electrocardiogram of rabbits under moderate hypoxia is retarded by prior administration of ammonium glycyrrhizinate. Administration of ammonium glycyrrhizinate to human subjects before subjecting them to hypoxia, did not influence the dark-adaptation curve nor mental alertness as measured by the stipple test. It is thought that extract of licorice increases hypoxia tolerance only if the hypoxic stress is severe enough to cause maximum adrenal stimulation followed by acute adrenal insufficiency. The effect of licorice extract is to preserve the electrolyte balance. (From the author's summary)

4310
Hamburger, R. J.
[AIRPLANE TRAVEL OF PATIENTS] Vliegtuigreizen van Patiënten. — Nederlandsch tijdschrift voor geneeskunde (Amsterdam), 99 (35): 2573-2576. Aug. 25, 1955. In Dutch, with English summary (p. 2576). DNLM

In advising patients traveling by air, the main factors of concern are oxygen deficiency and lowered atmospheric pressure. However, the altitudes employed for commercial flights result only in a slightly lowered oxygen tension in the arterial blood, which is of little importance even for patients with cardiovascular or respiratory disorders. Distension of body gases at lowered atmospheric pressure may cause discomfort whenever there is no escape of these gases to the outside. The stress caused by even a comparatively low flight evokes adaptation mechanisms. For some classes of patients, e. g. those suffering from tuberculosis, frequent flights may have harmful consequences. Apart from this there is no contraindication to occasional flights by patients.

4311
Hanks, T. G.
ROLE OF THE INDUSTRIAL PHYSICIAN IN THE PROBLEM OF NOISE IN INDUSTRY. — Noise Control, 1 (5): 15-20. Sept. 1955.
DLC (TA365.N6, v. 1)

The following outline is presented of the methods used by the physician within the aircraft industry in initiating and carrying forward a noise-control program: (1) Attention is called to the existing noise hazards, a committee on noise abatement is organized, and a policy for an employee educational program on hearing protection is prepared. (2) An evaluation is made of employee hearing loss and the presence of injurious noise levels within the company. (3) Based on audiometric findings, the efficacy of hearing-protection devices, noise-abatement measures, and the discipline program is determined. And (4) recommendations are made to management of employee placement with respect to noise exposures.

4312
Hansen, R. G.
THE EFFECT OF STATIC AIR PRESSURE IN THE EXTERNAL AUDITORY MEATUS ON HEARING ACUITY. — Wright Air Development Center, Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-95, April 1955. vii+61 p. AD 75 597 PB 128 139

Studies were conducted to determine the effects of various static air pressures in the external auditory meatus on (a) threshold sensitivity and (b) hearing acuity at two loudness levels (30 and 60 db.) above threshold. Measurements of threshold sensitivity were obtained by the Method of Adjustment for ten ears at each of forty-one frequencies from 100 to 8000 c. p. s. at each of four pressure conditions (-10, -20, +10, and +20 cm. H_2O). For all pressures used, threshold sensitivity was generally decreased for frequencies below 1500 c. p. s. with a slight increase in sensitivity for frequencies between 2300 and 8000 c. p. s. Results obtained from loudness balance judgments for six frequencies from 200 to 4000 c. p. s. indicate a general decrease in sensitivity for frequencies below 1000 c. p. s., and only slight effects on the higher frequencies. The effect of static pressure on speech intelligibility was found to be neglible. (Author's abstract, modified)

4313
Hardmeier, E.,
and H. K. Knoepfel
[THE PERSONALITY OF PILOTS SUFFERING FROM GASTRIC ULCER] La personnalité des pilotes atteints d'ulcère gastrique. — Médecine aéronautique (Paris), 10 (4): 411-413, 1955. In French.
DLC (TL555.M394, v. 10)

Two cases of gastric ulcer among aviation personnel are described in order to illustrate the theory that gastric or duodenal ulcer can be the symptom of deep emotional disturbance.

4314
Hardy, J. D.
CONTROL OF HEAT LOSS AND HEAT PRODUCTION IN PHYSIOLOGIC TEMPERATURE REGULATION. — In: The Harvey Lectures, 1953-1954, Series 49, p. 242-270. New York: Academic Press, Inc., 1955. DLC (R111.H33, 1953-1954)

Same as the report, item no. 2882, vol. III.

4315
Harker, G. S.,
and A. C. Henderson
EFFECTS OF INDUCED VERTICAL IMBALANCE ON DEPTH JUDGMENTS. — Army Medical Research Lab., Fort Knox, Ky. Report no. 201, Aug. 12, 1955. ii+13 p. (AMRL Project no. 6-95-20-001). AD 68 466 UNCLASSIFIED"

A binocular depth-judgment task was used to evaluate the effect of induced vertical imbalance on binocular vision. Zero, 1/2, and 1 prism diopters were used in conjunction with two alternation rates, 30 and 15 alternations per half-hour experimental period. The data were analyzed to show the effect of two exposure times, 15 and 30 minutes. The data of this study in conjunction with those of Ogle and Prangen indicate that the use of binocular instruments which require vertical fusional effort on the part of the observer will be most fatiguing when the observer seeks to change frequently from viewing with the instrument to viewing with the unaided eye. (Authors' abstract)

4316
Harnack, G. A. von
[INFLUENCING THE COURSE OF WHOOPING COUGH BY FLIGHTS] Die Beeinflussung des Keuchhustenverlaufes durch Höhenflüge. — Deutsche medizinische Wochenschrift (Stuttgart), 80 (25): 958-961. June 24, 1955. In German. DNLM

The treatment of whooping cough by a single flight at 3000 m. altitude for 1 1/2 hours was evaluated in 100 patients at various stages of the disease. The coughing attacks disappeared completely within a week in 18%; decreased by a half in 44%: were not affected in 38%. The flight was more beneficial in the milder cases.

4317
Harter, W.
[IS AIRSICKNESS CURABLE?] È curabile il mal d'aria? — Rivista di medicina aeronautica (Roma), 18 (3): 682-687. July-Sept. 1955. In Italian, with English summary (p. 687). DLC (TL555.A1R5, v. 18)

The etiology and symptoms of airsickness are briefly discussed and an antihistamic (Novamin) is recommended for its treatment.

4318
Hartman, B. O.,
and P. M. Fitts
RELATION OF STIMULUS AND RESPONSE AMPLITUDE TO TRACKING PERFORMANCE. — Jour. Exper. Psychol., 49 (2): 82-92. Feb. 1955. DLC (BF1.J6, v. 49)
Reprint also issued as: Ohio State Univ., Columbus (Contract AF33(038)10528); issued by Air Force Personnel and Training Research Center, Lackland Air Force Base, San Antonio, Tex. (Project no. 7707, Task no. 77133). Research Report no. AFPTRC-TN-55-20, Aug. 1955. AD 73 415 UNCLASSIFIED

The effects of visual stimulus and motor response amplitude and their interactions in a continuous tracking task were investigated. Determinations of scale effects were made for eight secondary task conditions including both pursuit and compensatory tracking displays, three categories of intricacy of the target course, and three frequencies of target motion. Relative performance improved significantly as display amplification was increased from 1/4 to 4 inches and as the amplitude of arm control motion was increased from 5° to 80°. Increase in intricacy of target motion reduced the advantage of large amplitude control movements. Pursuit tracking was markedly superior to compensatory tracking particularly with the most intricate target motion pattern. Changes in visual and motor scale effects are postulated to accompany a shift from primary dependence on visual cues to increased dependence on proprioceptive information in controlling sequences of movements. (From the authors' summary)

4319
Harvey, R. B.,
and J. A. Schilling
MEASUREMENT OF LUNG VOLUME BY RAPID DECOMPRESSION. — Jour. Applied Physiol., 7 (5): 496-500. March 1955. DLC (QP1.J72, v. 7)

A study in dogs of some of the factors involved in measuring lung volume during rapid decompression by the volume expansion method revealed that the diffusion of gas into the air passages under certain conditions may be the source of considerable error. The effusion of gas out of the lungs at low pressure was directly measured and found to increase greatly at pressures below 150 m. Hg. At these times the uptake of oxygen is impaired or reversed while the liberation of carbon dioxide may be temporarily increased. Hyperthermia was found to increase the rate of effusion at pressures which produce severe hypoxia. (Authors' abstract, modified)

4320
Hasbrook, A. H.
ANALYSIS OF STATEN ISLAND DOVE CRASH. — Aviation Age, 23 (1): 16-23. Jan. 1955. DLC (TL501.A8187, b. 23)

This is a condensed version of the report, item no. 2894, vol. III.

4321
Hasbrook, A. H.
AVIATION CRASH INJURY RESEARCH. — Jour. Aviation Med., 26 (3): 180-183. June 1955. DLC (RC1050.A36, v. 26)

Twelve years of crash-injury research in the civil aviation field have demonstrated that most

injuries and deaths in severe crashes resulted from the human body striking objects within, or a part of, the cockpit or cabin. An account of a large military transport crash is given; of the persons who died of head injuries, 40% had their skulls penetrated by the sharp steel tube uprights in the seat backs. Because efforts in the past have been aimed at accident prevention, little work has been done of an investigative nature after an accident. In the above mentioned accident, such an investigation was conducted; and it was determined that greater strength in seat designs plus elimination of the lethal features already mentioned, together with the use of crash helmets during take-off and landings, would moderate the chance of such fatal head injuries in the future. The investigation team should consist of a flight surgeon and a pathologist as well as the accident investigator. Detailed reports, in readily understood language, concerning the injuries and deaths be then submitted to the engineers for reference in future accident prevention design.

4322
Hatton, J. F.
INDUSTRIAL NOISE: APPLICATION OF CONTROL MEASURES BY THE INDUSTRIAL SAFETY ENGINEER. — Noise Control, 1 (5): 21-23, 80. Sept. 1955. DLC (TA365.N6, v. 1)

The safety engineer can prevent noise-induced hearing loss in an aircraft plant by: (1) conducting a plant survey for noise and sound levels; (2) eliminating or minimizing noise in shop areas by utilizing quieting machines; (3) providing pre-employment audiometry and periodic post-employment re-examinations; and (4) prescribing ear protectors (ear plugs, ear muffs).

4323
Hauty, G. T.,
and R. B. Payne
MITIGATION OF WORK DECREMENT. — Jour. Exper. Psychol., 49 (1): 60-67. Jan. 1955. DLC (BF1.J6, v. 49)

After preliminary training, 168 basic airmen performed a compensatory pursuit task for 7 hours. Each subject was randomly assigned one of 42 combinations of 7 pharmacological conditions, 3 information systems, and 2 conditions of goal proximity. At the conclusion the subjects performed a dissimilar perceptual-motor task for 16 min. Groups receiving single or multiple doses of d-amphetamine showed markedly less work decrement. A caffeine derivative was less effective in arresting work decrement. D-amphetamine added to a preparation of diphenhydramine hydrochloride and scopolamine reduced the effects of sedation on performance, but did not eliminate them completely. Both, supplementary signals and set induced by a more immediate goal produced sustained superior work proficiency. Fatigue effects induced during work on the pursuit task were not transferred to performance on the perceptual motor task. (cf. item 2900, vol. III)

4324
Haymaker, W.,
J. R. Teabeant, L. Krainer, and E. Schickele
HEAT STROKE: AN ANALYSIS OF 185 FATAL CASES [Abstract]. — Acta neurovegetativa (Wien), 11 (1-4): 142-145. 1955. In English. DNLM

The clinical data and autopsy material of 185 deaths due to heat stroke were analyzed. In most cases the temperature had either reached hyperthermic levels prior to admission to hospital or rose subsequently. Death from heat stroke occurred at very wide temperature ranges from 79° to 120° F. coupled with relative humidity in the ranges from 6 to 98%. It is evident that death can occur at low environmental temperature provided the evaporative power is sufficiently reduced, i. e., with high humidity. About 75% of cases occurred with 8 weeks of exposure to hot climate. Since acclimatization to high ambient temperature is achieved only after 8 weeks of exposure, lack of acclimatization was an important factor in production of heat strokes. The laboratory findings were negative in regard to hemoconcentration or dehydration. The postmortem findings of changes in brain or other organs are summarized. Shock is regarded as a secondary manifestation, non-specific in the fundamental pathogensis of heat stroke.

4325
Haymaker, W.,
and A. D. Johnston
PATHOLOGY OF DECOMPRESSION SICKNESS: A COMPARISON OF THE LESIONS IN AIRMEN WITH THOSE IN CAISSON WORKERS AND DIVERS. — Military Med., 117 (3): 285-306. Sept. 1955. DLC (RD1.A7, v. 117)

A review is presented of the pathology of decompression sickness including a comparison of the lesions in airmen, caisson workers, and divers. Cerebral histopathology is presented as related to cases of fatal decompression from increased atmospheric pressure, fatal decompression complicated by severe hypoxia, and fatal decompression complicating flights in jet planes. Involvement of the spinal cord in decompression sickness is discussed. (77 references)

4326
Hays, J. A.
SURVIVE. — Air Training, 4 (6): 13-19. Jan. 1955. DLC (UG633.A1A52, v. 4)

The advanced survival training course for aircrews conducted at Stead Air Force Base, Nevada, is described. The two-week course includes a 36-hour survival trek under realistic stress conditions.

4327
Hecht, F. 1952
[CHEMICAL PROBLEMS OF SPACE FLIGHT] Chemische Probleme des Weltraumfluges. — In: Probleme aus der astronautischen Grundlagenforschung [International Astronautical Congress, 3rd (Stuttgart, 1952), Proceedings], p. 30-39. Stuttgart, 1952. In German, with English summary (p. 30-31). DLC (TL787.144, 3rd, 1952)

The author envisions future tasks for chemists in space exploration. New synthetic materials resistant against extreme heat and cold will be necessary for the manufacture of space suits. Regeneration of water and chemicals from the expired air and physiological waste products poses many chemical problems. Food concentrates will take the place of a regular diet in order to save weight. Food elements could also be grown by hydroponics.

There will be a need for sleeping drugs and tranquilizers. In the field of physiological chemistry and biochemistry regulation of animal and human metabolism under conditions of lowered gravity, weightlessness, as well as under the influence of cosmic radiation, should be investigated. The biochemical influence of space cold and space radiation on the lower organisms is to be determined. In case there are microorganisms on other planets, effective means of disinfection will have to be devised.

4328
Heemstra, H.
PULMONARY VASCULAR RESISTANCE DURING HYPOXIA: FAST AND SLOW REACTION. — Acta physiologica et pharmacologica neerlandica (Amsterdam), 4 (2): 298. Aug. 1955. In English.
DLC (QP501.A3, v. 4)

This is a condensation of item no. 2904, vol. III.

4329
Hegnauer, A. H.
VENTRICULAR FIBRILLATION IN THE HYPOTHERMIC DOG: A STUDY OF UNDERLYING CAUSES AND MEANS OF CONTROL. — Boston Univ. School of Medicine, Mass. (Contract AF 18 (600)-65); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-79, Feb. 1955. vii+35 p. (RDO no. 696-69).
AD 63 618 PB 120265

Ventricular fibrillation is commonly observed as the cause of death in cold-water exposure. The effectiveness of a number of antifibrillary drugs including Dacorene, procaine amide, and Dilantin is evaluated. Dacorene administered in staggered dosage produced a transitory protection against ventricular fibrillation. However, when this drug was administered in a single large dose, the threshold of ventricular excitability was dangerously lowered. Neither epinephrine, nor venous or arterial pressure are factors implicated in the production of ventricular fibrillation. By means of a technique permitting direct measurement of ventricular excitability during cold-water exposure, the occurrence of ventricular fibrillation is shown to be associated with a significant rise of ventricular excitability during diastole, and with the appearance of an injury current in the electrocardiogram. Both the injury potential and the extremely low excitability thresholds are due to respiratory acidosis. Regulation of the respiratory ventilation rate and/or CO_2 content of the respired air permitted both injury current and threshold control in dogs at normal temperatures as well as in hypothermic animals. (Author's abstract, modified)

4330
Heinemann, E. G.
SIMULTANEOUS BRIGHTNESS INDUCTION AS A FUNCTION OF INDUCING AND TEST-FIELD LUMINANCES. — Jour. Exper. Psychol., 50 (2): 89-96. Aug. 1955. DLC (BF1.J6, v. 50)

By means of a binocular matching method, simultaneous brightness induction was studied as a function of test- and inducing-field luminances. The test field was disc-shaped and was surrounded by a contiguous annular inducing field. It was found that inducing fields of luminance much lower than the test-field luminance slightly enhance the visual effect of the test field. Inducing fields of luminance almost as great or greater than the test-field luminance depress the visual effect of the test field. (From the author's summary)

4331
Heinemann, E. H.,
A. M. Mayo, and H. L. Walpole
PILOT'S ESCAPE CAPSULE. — U. S. Patent 2,702,680. Feb. 22, 1955. 6 leaves. DP

A pilot's emergency escape capsule for airplanes in flight is described and illustrated. The capsule or pad is completely enclosed, pressurized, and insulated. It permits a pilot to be safely dropped from very high altitudes where the rarified atmosphere and extreme cold would normally destroy life. The cockpit capsule is blown from the plane when a release control is pulled by the pilot. The capsule floats in water and may serve as a boat for pilots ejected over the ocean.

4332
A HELICOPTER FLIGHT SIMULATOR FOR PILOT TRAINING. — I. T. A. Bulletin (Paris) 1955 (36), article 631/IS. 1 p. Oct. 10, 1955.
DLC (TL502.149)

A helicopter flight simulator has been developed in France for pilot training and for the study of helicopters in the design stage. The DX-50 comprises a computer, cabin with pitch and roll, and a panoramic horizon, and simulates any helicopter by setting of control and stability parameters. A simulator developed by Bell for the U. S. Navy comprises a panoramic screen, a cabin similar to that of the Bell 47, and a computer.

4333
HELICOPTER PILOTS FOR THE ARMY. — Aircraft (Toronto), 17 (11): 29-30, 68. Nov. 1955.
DLC (TL501.A56143, v. 17)

The helicopter training program of the Canadian Joint Air Training Center at Rivers, Man., is described. Army and RCAF light-plane pilots with a minimum of 300 hours flying time are given 25 hours of ground training and 44 hours (half solo) of flight training. Instruction includes landing and take-off, hovering, hoisting, maneuvering, engine handling, casualty evacuation, theory of flight, maintenance, regulation, and weight and balance. Graduates become instructors or remain in a pool used for rescue and transport missions.

4334
Helmsworth, J. A.,
W. J. Stiles, and W. Elstun
CHANGES IN BLOOD CELLULAR ELEMENTS IN DOGS DURING HYPOTHERMIA. — Surgery, 38 (5): 843-846. Nov. 1955. DLC (RD1.S78, v. 38)

Blood samples withdrawn from anesthetized dogs during hypothermia showed a rise in hematocrit and mean corpuscular volume and considerable declines in total leukocyte count, total eosinophil count, mean corpuscular hemoglobin concentration, and in the number of platelets. A relationship is suggested between the thrombocytopenia induced by hypothermia and the hemorrhagic diathesis often noted after rewarming.

4335
Henderson, A. M.
EJECTION KNOW-HOW. — Combat Crew, 5 (9): 8-9. March 1955. DLC

The 1953-1954 series of experimental downward ejections from a B-47 bomber is described. After adjustment in the D-ring trigger device, successful ejections were accomplished at speeds up to 425 knots and at altitudes up to 45,000 feet. Of interest were the effects of windblast on personal equipment, including loss of helmet and mask and damage to the underarm preservers. Successful ejection technique includes familiarity with emergency procedure and avoidance of panic during free fall.

4336
Henderson, A. M.
PARTIAL PRESSURE SUIT. — Combat Crew, 5 (11): 12-13. May, 1955. DLC

A description of the construction and operation of the MC-1 partial pressure suit is presented for the instruction and orientation of airmen.

4337
Hendler, E.
LINEAR ACCELERATION AS A SURVIVABLE HAZARD IN AVIATION. — Jour. Aviation Med., 26 (6): 495-502. Dec. 1955. DLC (TL555.A1A4, v. 26)
Issued also as an unnumbered report of the Naval Air Material Center. Aeronautical Medical Equipment Lab., Philadelphia, Pa. 13+2 p. AD 59 333 UNCLASSIFIED

This study was designed to observe the magnitude of the forces acting upon bodies (inanimate in this experiment) subjected to high speeds of linear acceleration. A specially constructed catapult was used which was activated by pneumatic force, and hydraulically controlled. A ram supplied the accelerative force to a catapult car which slid upon two parallel tracks; these tracks had wire coils mounted on brackets along the first 12 feet of their length which were designed to measure time-displacement relationships of the car by producing signals as a magnet fixed to the car passed over them. Anthropomorphic dummies were used in the various tests, and various types of supporting and restraining gear were tested with the dummies. Wire strain gauge-type accelerometers and tensiometers measured the forces which acted upon the car and the dummies. The primary observation of the series of tests was that peak accelerations measured in the dummies, supported in many positions by various kinds of protective equipment, are greater than those accelerations measured in the car at the same time. Extreme violence of movement by the dummies under the forces of acceleration was recorded by high speed motion picture cameras. Equipment failure occurred at average levels below 30 g measured upon the catapult car.

4338
Henneman, R. H. 1952
and L. S. Reid
AN ANALYSIS OF GROUND-AIR COMMUNICATION FROM THE STANDPOINT OF HUMAN ENGINEERING [Abstract]. — In: Airborne electronics, 1952 (National Conference on Airborne Electronics, Dayton, Ohio, 1952), p. 129-130.
DLC (TL693.A3, 1952)

The process of ground-to-air communication is analyzed in regard to the psychological aspects of the sending, transmission, and receiving stages and their relationship to the technical operation of the communication system.

4339
Henneman, R. H. 1954
and E. R. Long
A COMPARISON OF THE VISUAL AND AUDITORY SENSES AS CHANNELS FOR DATA PRESENTATION. — In: Airborne electronics digest, 1954 (National Conference on Airborne Electronics, Dayton, 1954), p. 108-109.
DLC (TL693.A3, 1954)

The information presented here in abbreviated form is covered extensively in the report, item no. 2912, vol. III.

4340
Henneman, R. H.,
L. S. Reid, and E. R. Long
THE INFLUENCE OF CATEGORICAL CUING ON THE IDENTIFICATION OF VISUALLY DISTORTED WORDS SELECTED FROM A LOGICALLY ORGANIZED POPULATION. — Univ. of Virginia, Charlottesville (Contract W33(038)-ac-21269); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio (Project no. 7192). WADC Technical Report no. 54-362, April 1955. iv+15 p. AD 85 567
UNCLASSIFIED

In air communication the identification of ambiguous message signals is substantially aided by operator familarity with the message population and by the high degree of contextual redundancy present. Previous laboratory research on perceptual setting as an aid to the identification of ambiguous messages has ignored the factors of familiarity and contextual organization. The present experiment constituted an attempt to learn whether further response restriction in the form of setting cues would facilitate the recognition of visually distorted words drawn from a logically organized population, when subjects were familiar with the word categories and the specific words. Experimental variables were (1) degree of categorical restriction (in cuing), (2) type of familiarization (categories only or categories plus specific words), and (3) temporal position of the setting cues (before or after stimulus presentation). Principal findings were: (1) Increases in categorical restriction led to improved identification. (2) Familiarity with specific words, apart from a knowledge of the word categories, significantly improved identification. (3) Temporal position of cuing was not a significant factor. These results imply the probable helpfulness of setting cues for the identification of ambiguous messages in operational situations where familiarity and context have already markedly restricted the operator's responses. (Authors' abstract)

4341
Henneman, R. H.,
and T. L. Matthews
THE INFLUENCE OF MESSAGE LENGTH AND DISTRACTING TASK COMPLEXITY. — Univ. of Virginia, Charlottesville (Contract W33(038)-ac-

21269); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-145 April 1955. iv+16 p. (Project no. 7192). AD 88 329
UNCLASSIFIED

The intelligibility of aurally (voice) and visually (printed) presented messages, typical of those exchanged in air operations, was compared in a distracting task situation (pressing buttons in a memorized sequence) with (1) message length and (2) task complexity as the principal variables. Message comprehension was measured by the subject's recall of the message exactly as heard or read. Little difference between auditory and visual presentation was found for the short messages and simple tasks. As task complexity increased there was a marked difference favoring auditory presentation. Message scores and task scores decreased as either message length or task complexity was increased. The results of the experiment are interpreted as evidence of the superiority of voice communication and of the interrelation of message reception and competing task as components in a complex task situation.

4342
Henneman, R. H.,
and N. R. Outcalt
THE INFLUENCE OF SETTING CUES ON MANUAL RESPONSES MADE TO FOLLOWING-INSTRUCTIONS MESSAGES. — Univ. of Virginia, Charlottesville (Contract W33(038)-ac-21269): issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-365, April 1955. iv+14 p. (Project no. 7192). AD 90 893
UNCLASSIFIED

The adequacy of a data-presentation link in a communication system is in part determined by the success with which the operator responds to the information received, for example, moving the correct control, or carrying out the instructions contained in a message. Previous laboratory experiments had demonstrated the effectiveness of setting cues in facilitating the identification of ambiguous messages and in check-reading dials. The present experiment was designed to discover the effectiveness of setting cues in facilitating manual responses made to following-instructions messages. Experimental variables were (1) type of setting cues and (2) degree of setting. Subjects were required to locate and manipulate in a definite sequence designated groups of switches on a panel matrix of 64 switches. "Messages" conveyed the instructions indicating the specific switches to be thrown on each trial. Setting cues afforded the subjects information as to the location or sequence of switches to be thrown. Response efficiency was measured in total response time. It was found that: (1) both types of cuing significantly facilitated the response; (2) the effects of the cuing varied in accordance with their presumed degree of response restriction. (Authors' abstract)

4343
Hermann, H.,
and J. F. Cier
[PERIPHERAL HEMODYNAMICS OF THE ORGANISM EXPOSED TO COLD] L'hémodynamique périphérique de l' organisme soumis au froid. — Archives des sciences physiologiques (Paris), 9 (4): C127-C137; discussion, p. C137-C139. 1955. In French.
DNLM

A review is presented of experimental observations of the peripheral hemodynamic response of animals exposed to cold. The response has been observed to consist of a reflex vasoconstriction of the cutaneous arterioles, followed by a vasodilatation of the capillaries and blood agglutination. Section of components of the nervous system has shown that the initial vasoconstriction is independent of the central thermoregulatory mechanism and occurs after almost total local denervation. Local application of cold produces a vasoconstrictor response in unexposed areas through the efferent sympathetic vasomotor system. The thermoregulatory center is involved in peripheral hemodynamics apparently only after central cooling. (70 references)

4344
Hermanuz, N.
[CLINICAL INVESTIGATIONS ON THE PROBLEM OF THE SIGNIFICANCE OF THE SPLEEN AND LIVER FOR THE CIRCULATION AND THE HEART] Klinische Untersuchungen zu der Frage der Bedeutung der Milz und der Leber für Kreislauf und Herz. — Archiv für Kreislaufforschung (Stuttgart), 23 (1-3): 1-11. Nov. 1955. In German.
DLC (QP101.A64, v. 23)

Extensive electrocardiographic and hemodynamic studies were conducted with 19 patients splenectomized after a traumatic rupture of the spleen, and 33 patients who had suffered a liver injury at least 2 years ago. No objective pathological changes were demonstrated in the heart or the circulatory system under varied investigative conditions of rest, hypoxia in a low pressure chamber, and different physical stress tests. In contrast to the findings reported from animal experiments, the capacity of the cardiac muscle, the lungs, and the circulatory system to adapt to severe hypoxia (4000 m. altitude) was unimpaired in these patients.

4345
Hernández-Peón, R.,
and H. Scherrer
'HABITUATION' TO ACOUSTIC STIMULI IN COCHLEAR NUCLEUS. — Federation Proceedings, 14 (1[I]): 71. March 1955.
DLC (QH301.F37, v. 14)

The phenomenon of habituation to acoustic stimuli was studied by recording click responses with bipolar electrodes in the cochlear nucleus of unanesthetized cats. The repetition of single clicks at intervals of no less than 2 seconds caused the action potential in the cochlear nucleus to diminish or disappear for as long as 15 hours of interrupted stimulation. Novel auditory stimulation of a different tone was not blocked by habituation to another auditory stimulus, but was blocked by simultaneous application of visual stimuli. Acoustic habituation disappeared under deep Nembutal anesthesia. It is indicated that the brain stem reticular formation is responsible for the inhibitory effect, since habituation disappeared after lesion of the midbrain tegmentum. It is suggested that the selective inhibitory mechanism is important in the focusing of attention for sensory perception.

4346
Heroux, O.
ACCLIMATION OF ADRENALECTOMIZED RATS TO LOW ENVIRONMENTAL TEMPERATURE. — Amer. Jour. Physiol., 181 (1): 75-78. April 1955. DLC (QP1. A5, v. 181)

Adrenalectomized rats supplied with a 0.9% saline drinking solution with or without supplementary DCA (desoxycorticosterone acetate) were maintained with unadrenalectomized controls at 30°C., or were cold-acclimatized by exposures for short daily periods to a temperature of 6°C. Although unadrenalectomized controls showed a higher rate of survival in tests at -18°C. than adrenalectomized animals similarly acclimatized, the adrenalectomized cold-acclimatized animals were more resistant than warm-acclimatized animals. Acclimatization temperature had no significant effect on the amount of weight gained, while adrenalectomy without DCA supplementation decreased weight gain. DCA had no effect on survival rate at -18°C., indicating an absence of correlation between weight gain and survival rate.

4347
Hertzman, M.,
C. P. Seitz, and J. Orlansky
STABILITY OF PERSONALITY STRUCTURE UNDER ANOXIA. — Jour. Gen. Psychol., 52 (1): 65-73. Jan. 1955. DLC (BF1. J64, v. 52)

The Rorschach test was administered to 20 male subjects in small groups (1) at sea level, and (2) 15 min. after reaching a simulated altitude of 18,500 ft. with a 10- to 14-day interval between tests. The procedure was reversed for the second group of 20 subjects. All subjects experienced physiological distress under anoxic conditions. Rank difference correlations were obtained for 12 Rorschach factors at sea level and under anoxic conditions. It was concluded, that (1) personality structures remain stable under severe anoxic stress; (2) anoxic stress affects the emotional sphere, as shown by a tendency toward loss of emotion control, emotional disorganization, and increased anxiety (there is an attempt to compensate by becoming more constricted); (3) the Rorschach is a more sensitive indicator if administered in a sequence of experimental stress condition-control condition.

4348
Hessinger, R. W., 1954
and J. W. Ballard
THE TACTICAL SENSORY GUIDANCE SYSTEM FOR PSYCHOLOGICAL STUDIES OF AIRCRAFT ATTITUDE CONTROL. — In: Airborne electronics digest, 1954 (National Conference on Airborne Electronics, Dayton, 1954), p. 110-113. DLC (TL693. A3, 1954)

An experimental Tactual Sensory Guidance System was developed as a research tool for investigation of the feasibility of employment of this sensory modality for aircraft attitude control to relieve overloading of the visual and aural channels of the pilot. An electronic thumb actuator delivers a pressure signal in discrete frequency steps in one of three band widths (5-25 pulses/sec., 20-25 pulses/sec., and 50-100 pulses/sec.) to four distinct points of contact on the thumb. The first two points provide pitch control, while the last two provide bank control. A course difference is signaled by the lowest signal frequency applied to the proper thumb area. Successive increases in course difference are signaled by the middle- and high-frequency signals to the thumb unit.

4349
Hickam, J. B.,
H. O. Sieker, W. W. Pryor, and R. Frayser
USE OF THE SEELER RESUSCITATOR IN MAN. — Duke Univ. School of Medicine, Durham, N. C. (Contract AF 33(616)-441); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-165, March 1955. vi+50 p. (Project no. 7160). AD 75 187 UNCLASSIFIED

Equations describing the complete respiratory cycle of the Seeler resusciator are presented. The successful use of the resuscitator in unconscious patients affected by carbon dioxide retention is described. A detailed comparison of the ventilation predicted on the basis of the resistance and compliance of one patient with the ventilation actually provided by the resuscitator gave general, but not close, agreement. Hyperventilation with the resuscitator produced no significant fall in blood pressure in six normal subjects under light pentothal anesthesia, but did decrease the oxygen content of cerebral venous blood.

4350
Hiestand, W. A.,
F. W. Stemler, and R. L. Jasper
INCREASED ANOXIC RESISTANCE RESULTING FROM SHORT PERIOD HEAT ADAPTATION. — Proc. Soc. Exper. Biol. and Med., 88 (1): 94-95. Jan. 1955. DLC (QP1. S8, v. 88)

Mice exposed to heat in an incubator at 36-37°C. for periods of 10 and 14 days were drowned in water of approximately body temperature. Heat adaptation was found to increase anoxic resistance to drowning (survival time) by 14.5% after 10 days and by 28.9% after 14 days. The effect is attributed to lowered basal oxygen requirements in heat-adapted animals. (Authors' summary, modified)

4351
HIGH ALTITUDE CUTS VISION. — Science News Letter, 67 (14): 215. April 2, 1955. DLC (Q1. S76, v. 67)

A brief note is presented on the empty-field myopia of pilots, a condition caused by the absence of objects on which the eye can focus while flying at high altitudes in an empty, cloudless sky. Mention is also made of studies dealing with the cause of death of victims in two Comet aircraft crashes whose bodies showed signs of scalding or burning of the clothed areas. The darkened skin was found to be due to suntanning after death.

4352
Highman, B.,
and P. D. Altland
EFFECT OF ALTITUDE AND COBALT POLYCY-

THEMIA, HYPOXIA, AND CORTISONE ON SUSCEPTIBILITY OF RATS TO ENDOCARDITIS. — Circulation Research, 3 (4): 351-356. July 1955. DLC (RC681.A1A57137, v. 3)

Rats with polycythemia induced by exposures to simulated high altitudes developed a significantly higher incidence of endocarditis following intravenous bacterial injections than rats with cobalt polycythemia or ground level controls. No increase occurred in altitude rats when polycythemia was prevented by repeated bleedings. These findings suggest that both polycythemia and hypoxia are necessary to explain increased susceptibility of altitude rats. Cortisone increased susceptibility of ground level rats injected with Streptococcus faecalis. Unlike altitude exposures, however, cortisone did not render rats susceptible to endocarditis due to Hemophilus parainfluenzae. (Authors' abstract)

4353
Hildebrandt, G.
[INVESTIGATIONS ON THE RHYTHMIC FUNCTIONAL RELATIONSHIP BETWEEN PULSE AND RESPIRATION] Untersuchungen über die rhythmische Funktionsordnung von Puls und Atem. — Acta medica scandinavica (Stockholm), Suppl. 307: 175-184. 1955. In German. DNLM

The simultaneous records of the pulse rate and respiratory rate over a 25-hour period taken from healthy individuals on bed rest and a regular diet gave 4.0 as the normal pulse-respiratory quotient. This is particularly well expressed in the early morning hours. The diurnal variation in pulse-respiratory quotient is subject to individual differences. Certain relationships were observed between the pulse-respiratory quotient, the reticulocyte count, variations in the atmospheric pressure, and the level of consciousness.

4354
Hilger, J. A.
FINAL REPORT ON OPERATIONAL SUITABILITY TEST OF APPRENTICE AIR PASSENGER AND RATIONS SPECIALIST GRADUATES OF TTAF COURSE NO. AB60130. — Air Proving Ground Command, Eglin Air Force Base, Fla. Oct. 10, 1955. iii+25 p. (Project no. APG/CSC/580-A). AD 74 975 UNCLASSIFIED

Evaluation was made of the ability of the apprentice air passenger and operations specialist graduate of the technical training Air Force course no. AB60130 to (1) perform the duties of his specialty: (2) determine job areas in which training should be improved; and (3) provide information for optimum utilization of the apprentice. The apprentice is required to perform the duties of his specialty at the apprentice level and to progress to senior-level skill without further formal training. The duties of the graduate are to (1) schedule, clear, and dispatch aircraft; (2) prepare and maintain records on air passengers and operations activities; (3) process passengers for flight; (4) provide passenger services, and (5) supervise air passenger and operations personnel. Graduates were evaluated while performing the normal duties encountered by regular replacements. (From the AD abstract)

4355
Hill, C. W.
MILITARY PSYCHOLOGY. — In: Present-day psychology, p. 437-467. Ed. by A. A. Roback. New York: Philosophical Library, 1955. DLC (BF121.R58)

Selected psychological research activities of the military services are reviewed. Recent efforts of the military psychologist have been in the fields of general and specialized personnel selection, training, operational management, and leadership. Paper-and-pencil tests widely used to test intelligence, aptitude, and proficiency have been proven in Korea to be of limited value in the selection of personnel. The importance of intangible personality traits, morale, and motivation is recognized, and means to test and develop these characteristics are being examined. An attempt is being made to present more effectively training information, and to coordinate equipment design with operators' needs.

4356
Hill, J. C.
AN ELECTRIC GRILL FOR USE IN AIRCRAFT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-509, June 1955. v+23 p. (Project no. 6331). AD 82 813 UNCLASSIFIED

A sandwich grill consisting of two concave grids mounted on a cast aluminum base and producing a toasted sandwich sealed about the perimeter by a baked crust was found to be functional at ambient temperatures from -40° to 140°F. and altitudes of ground level to 15,000 feet. Acceptance studies conducted during flight indicate that most sandwiches prepared with the grill are moderately to highly acceptable. The grill is considered a useful and compact means of feeding transport and bomber personnel in flight.

4357
Hill, N.,
and P. de Guillenchmidt
THE POSSIBILITY OF THE FLIGHT SIMULATOR AS A TRAINING AID TO HELICOPTER PILOTS. — Jour. Helicopter Assoc. Great Britain (London) 8 (4): 133-157. April 1955. DLC (TL716.H44, v.

The development of flight simulators is discussed with special reference to the DX-50 and DX-80 simulators and two types of trainers, the DX-32-C and the DX-32-B hovering trainer. Used as a training aid to helicopter pilots these flight simulators and synthetic trainers are effective, safe, and inexpensive. They also permit the early selection of pupils, as it is during this period of training that the instructor can generally determine pilot aptitude and fitness. Mention is made of the value of simulators in the conversion of pilots to operational type helicopters, high-altitude flying, refresher training, and instrument flight training.

4358
Hillman, B.,
G. B. Lee, and H. G. Sperling
BRIGHTNESS THRESHOLDS AS A FUNCTION OF TARGET CONTRAST AND RETINAL POSITION.

— Naval Medical Research Lab. New London, Conn. Report no. 266 (vol. 14, no. 6), July 11, 1955. iv+12 p. (Project Report no. NM 002 014.09.04). AD 81 559 UNCLASSIFIED

The variations in brightness threshold for targets of differing contrasts were studied at eight positions on the temporal retina. Thresholds following 25 minutes of dark adaptation are reported for two subjects who judged the orientation of rectangular test objects subtending 1° x 1/3° of visual angle and having 16, 26, 38, 51, and 96.4 per cent contrast with the background. The constant-stimulus method was used. The results show a marked drop in threshold for all retinal positions as contrast increases. The threshold curves show that there is an optimum point of off-center viewing for each contrast. This point moves from four to eight degrees as contrast varied from 16 to 96.4 per cent. At no contrast level does central viewing prove superior. Likewise, extreme parafoveal viewing yields high thresholds for the targets studied. (NMRL abstract)

4359
Hinchcliffe, R.,
and L. J. Wheeler
INVESTIGATION INTO THE EFFECT OF FLYING ON SPEECH INTELLIGIBILITY IN NOISE. — Flying Personnel Research Committee (Gt. Brit.). FPRC no. 917, May 1955. 4 p. AD 68 435 UNCLASSIFIED

The Royal Air Force Hearing Efficiency Test was administered to crew members of four Shackleton aircraft before and after long operational flights. No deleterious effect was found on the crews' hearing efficiency over the telecommunication channels as distinct from any effect on auditory acuity.

4360
Hirsh, I. J.,
and R. C. Bilger
AUDITORY-THRESHOLD RECOVERY AFTER EXPOSURES TO PURE TONES. — Jour. Acoust. Soc. Amer., 27 (6): 1186-1194. Nov. 1955. DLC (QC221.A4, v. 27)

Studies of the auditory threshold after 15-second to 2-minute exposures to a 1000-c.p.s. tone indicated that temporary hearing loss at the stimulating frequency was greater up to about 1 minute after exposure when the stimulation tone was 20 db. above threshold than when it was 60 to 100 db. above threshold. After a 4-minute exposure, the threshold was greater for a 100-db. intensity level, but was greater after a 20-db. exposure than after a 60-80-db. exposure. The initially greater loss at 20 db. was due to the gradual recovery of hearing at this intensity level, while at higher intensities recovery was initially rapid. At high intensities, however, recovery either slowed down after 1 minute, or a second rise in threshold occurred. Threshold loss at a frequency higher than the stimulating frequency increased linearly with increases in intensity and duration of the stimulating tone. Although the results were obscured by differences among individuals, the mean recovery curves at stimulating frequencies of different intensities and durations indicate the presence of more than one underlying recovery process.

4361
Hirsh, I. J.
MILITARY AUDIOMETRY: A CLASSIFICATION OF HEARING TESTS. — In: Davis, H., D. H. Eldredge, and J. R. Usher. The Testing of Hearing in the Armed Services; (Proceedings of the Third Annual Meeting of the Committee on Hearing and Bio-Acoustics at the United States Naval Hospital, National Naval Medical Center, Bethesda, Maryland, 25-26 October, 1955), p. 83-92. Armed Forces-National Research Council Committee on Hearing and Bio-Acoustics, St. Louis. Report no. 5, Oct. 1955. DNLM

The purposes of military audiometry are discussed, including: (1) selection or rejection of men as part of the regular initial physical examination; (2) provision of information on the state, probable cause, and progress of hearing loss; (3) provision of information to establish amount of hearing loss for compensation purposes; and (4) qualification of individuals for military specialties involving hearing ability. The available hearing tests, including the absolute threshold test, screening test, and specialized audiogrammatic tests, are described and briefly related to military audiometric requirements. A standard group screening test is recommended for selection of personnel, with individual diagnostic audiometry reserved for cases of hearing loss.

4362
Hitchcock, F. A.,
and J. Kemph
THE BOILING OF BODY LIQUIDS AT EXTREMELY HIGH ALTITUDES. — Jour. Aviation Med., 26 (4): 289-297. Aug. 1955. DLC (RC1050.A36, v. 26)

The reactions observed in animals explosively decompressed to 30 mm. Hg are summarized, with particular regard to vaporization of body fluids. Respiration increases in depth and rate; marked abdominal distention sets in, due to expansion of gases in the intestine; collapse and convulsions occur within 8-12 seconds after the initiation of decompression; a secondary swelling commences within 30-40 seconds which begins at the lower extremities and progresses toward the head. There is a sudden slowing of the heart and a drop in arterial pressure to about 50 mm. Hg which occurs in 15 seconds; the venous pressure increases by about 25 mm. Hg and the pulse pressure often disappears. A Diodrast solution was injected into the external jugular vein of each of 10 dogs at the instant of decompression; using X-ray observation, it was seen that the medium traversed the pulmonary circulation and reached the left heart in only 4; in one, it traveled up to the pulmonary vein; in 2, it reached the pulmonary artery only; and in 3, the right ventricle was not reached. It is concluded that circulatory stasis occurred within 10-16 seconds after decompression. Under such conditions, gas was found in the heart and the thoracic cavity within the intrapleural space, causing partial lung collapse.

4363
Hochberg, J.,
and Olin Smith
LANDING STRIP MARKINGS AND THE "EXPANSION PATTERN". I. PROGRAM, PRELIMINARY ANALYSIS, AND APPARATUS. — Perceptual and Motor Skills, 5 (2): 81-92. June 1955. DLC (BF311.P36, v. 5)

The perceptual problem faced by the pilot approaching a carrier deck is analyzed theoretically, on the basis of relative changes of position and rates of movement of points in the perceptual field. Terms are defined, apparatus for empirical measurements is described, and a general program of research is indicated. (Authors' summary)

4364
Hodler, J.,
and L. Neuburger 1954
[THE BEHAVIOR OF CAPILLARY RESISTANCE DURING PHYSIOLOGICAL STRESSES OF SPORTS AND CLIMATE] Das Verhalten der Kapillarresistenz bei sportlichen und klimaphysiologischen Beanspruchungen. — Schweizerische Zeitschrift für Sportmedizin (Genève), 2: 9-21. 1954. In German, with English summary (p. 21). DNLM

The analysis of the resistance of subcutaneous capillaries in a sports training camp at high altitude (Jungfraujoch) and under thermal extremes (refrigerating chamber and steam bath) has yielded further facts to strengthen the view that physiological variations of the capillary resistance in human subjects are largely produced by pressure changes in the subcutaneous capillaries. This fact is of importance in clinical diagnoses, where one is advised to refrain from generalizing on the basis of changes in capillary resistance without taking into consideration the condition of skin circulation. (Authors' summary, modified)

4365
Hogan, G. W.,
and N. E. Stingely
AN EVALUATION OF THREE ACTIVATED CARBON ODOR CONTROL DEVICES. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-498, Dec. 1955. iii+13 p. (Project no. 6354). AD 96 140 UNCLASSIFIED

A test program for the evaluation of three types of activated carbon odor-control devices has been completed. The four Air Force hospitals which performed the tests did not have a sufficient number of odor cases from Jan. through Aug. 1955 to determine the efficiency of any of the devices. The military Air Transport Service, upon whose request this evaluation had been begun, declined to participate in the test program for the same reason. The hospital reports did, however, indicate some limitations connected with the use of several of the items. The evaluation is, therefore, terminated without conclusive results. It is concluded that the need for odor control devices or agents in the Air Force hospitals and Military Air Transport Service aeromedical evacuation flights is not sufficient to support standardization action of these items. (Authors' abstract)

4366
Hogan, R. J.,
and N. E. Schmitt
A CAN-PIERCING DRINKING DEVICE FOR CONSUMING LIQUID FOODS AT ALTITUDE. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-200, April 1955. v+16 p. (Project no. 6331). AD 88 770 UNCLASSIFIED

A simple, convenient device for drinking canned liquids during flight in high performance aircraft has been developed. This drinking device was evaluated in the laboratory and during supervised flight tests. The item was service tested by long range fighter units of the Strategic Air Command during extended range missions in the F84-G aircraft. The drinking device is considered suitable for standardization and issue to pilots and crew members of high performance aircraft. (Authors' abstract)

4367
Holahan, J.
PANORAMIC PICTURE SIMULATES 'COPTER FLIGHT. — Aviation Age, 24 (1): 54-60. July 1955. DLC (TL501.A8187, v. 24)

A helicopter simulator which artificially creates the entire visual environment of the pilot has been developed by Bell for the U. S. Navy. A heliport scene painted in three dimensions on a transparency is projected onto a curved screen extending below and in front of a stationary fuselage. The pilot is allowed three translational and three attitude degrees of freedom by control movements which are converted by a computer and servo mechanism into movements of the projector. Three projectors with translational and rotational freedom combine to simulate the horizon, a hovering position from touchdown to 55 ft., and autorotation from 55 to 500 ft.

4368
Hollander, E. P.,
and W. B. Webb
LEADERSHIP, FOLLOWERSHIP, AND FRIENDSHIP: AN ANALYSIS OF PEER NOMINATIONS. — Jour. Abnormal and Social Psychol., 50 (2): 163-167. March 1955. DLC (RC321.J7, v. 50)

Same as item no. 2944, vol. III.

4369
Holm, R. L.,
J. J. Dalglish, E. W. Lager, W. A. Beer, and A. C. Maloney
QUICK DETACHABLE HARNESS. — U. S. Patent 2,754,073. July 10, 1956. 5 leaves. DP

A quickly detachable harness latch for airplane pilots is described. The device features (1) incorporation of the parachute key in the structure of the latch, (2) a fastening operation consisting of insertion of the parachute key and pivoting of the latch locking lever, (3) use of the parachute key as a lug for connecting the detachable parts of the harness, (4) manual or automatic disconnection, and (5) a novel lock and disconnect piston device.

4370
Höök, O.
[NEUROLOGIC OPINIONS ON SYNCOPE] Neurologiska synpunkter på svimning. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (3): 5-8. 1955. In Swedish. DNLM

The author discusses differential diagnoses of causes of syncope on the basis of post-syncopal examination. Types of symptomatic and cryptogenetic epilepsy are identified, e.g. akinetic epilepsy, psychomotor attacks, and various forms of

aura (forced thinking, dreamy states, déja vu, and depersonalization). Other causes include sinus caroticus syndrome, cough syndrome, intracranial bleeding, brain tumors, etc. In addition to a history of preceding and subsequent symptomatology, the diagnosis should be based on orthostatic tests, tolerance tests of the circulatory system, and a complete neurologic examination including EEG and pneumo-encephalogram.

4371
Hoover, G. W.
INSTRUMENT SIMPLIFICATION. — Aeronaut. Engin. Rev., 14 (8): 16-20. Aug. 1955.
DLC (TL501.A326, v. 14)
Essentially the same: Inst. of the Aeronautical Sciences, New York, N. Y. IAS Preprint no. 527, [no date]. 7 p. DLC (TL507.I55, no. 527)

A discussion is presented on the development of a method for display design for orientation instruments on aircraft, that provide data normally obtained from visual contact, without permitting the design decisions to be influenced by personal opinion. The pilot states what information is required; the human engineer determines the best methods of measurement and implementation; the systems engineer develops the most efficient integration; and the coordinator develops the most efficiently instrumented airplane. Following this method, the instrument display will always be fundamentally correct having met not only the operational requirements but the psycho-physiological requirements as well.

4372
Hoover, G. W.
A METHODOLOGY FOR INSTRUMENT DISPLAY DESIGN. — In: North Atlantic Treaty Organization, Anthropometry and human engineering, p. 63-72. London, Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 5)

A methodology is described for the elimination of personal opinion in the display design of flight instruments providing data normally obtained from visual contact. The method consists of: (1) establishment of the fundamental information requirements of each phase of flight, (2) establishment of performance limits within which the pilot may safely operate, (3) establishment of visual cues providing the information required, and (4) determination of the display on the basis of required visual cues.

4373
Hoover, G. W.
A NEW CONCEPT FOR AIRLINE COCKPITS. — Skyways, 14 (4): 10-11, 42. April 1955.
DLC (TL501.S634, v. 14)

An approach to cockpit instrument design based on piloting needs rather than engineering specifications is advocated. The present compromise between efficient instrumentation and payload requirements must be accompanied by a long-range development program whose main goal will be integral presentation of the components of information required by the pilot.

4374
Hoover, G. W.
A NEW LOOK FOR AIRCRAFT INSTRUMENTATION. — Off. Naval Research, Research Rev., 1955 (May): 6-9. DLC (Q180.U5A54, v. 1955)

The program and preliminary findings of the Office of Naval Research in the long-range development of adequate instrumentation displays are briefly discussed.

4375
Horne, E. P.,
and A. E. Eschenbach
THE EFFECT OF LOCALIZED MONAURAL CUES ON A VISUALLY CONTROLLED TURNING MOVEMENT. — Jour. Gen. Psychol., 53 (2): 287-292. Oct. 1955. DLC (BF1.J64, v. 53)

The effect of the introduction of a unilateral auditory stimulus as a possible distraction prior to a light signal for a turn in the cockpit of the Link trainer was studied in 10 naive subjects. The sound did not influence the speed of turning the Link through 45 degrees. There was no significant difference in the performance of individuals turning into the sound, away from the sound, or without auditory stimulation. (Authors' conclusions, modified)

4376
House, H. P.
THE PHYSIOLOGY OF HEARING LOSS. — Noise Control, 1 (4): 8, 56. July 1955.
DLC (TA365.N6, v. 1)

Exposure of susceptible individuals to high noise levels over a prolonged period of time frequently produces hearing loss. As control measures, routine pre-placement audiograms are advocated for individuals entering noisy industries, followed by periodic audiograms in order to detect at the earliest possible date any developing ear damage due to noise exposure.

4377
Houston, C. S.
SOME OBSERVATIONS ON ACCLIMATIZATION TO HIGH ALTITUDE. — New England Jour. Med., 253 (22): 964-968. Dec. 1, 1955.
DLC (R11.B7, v. 253)

Man's only means of surviving exposure to increasing altitude is by an integrated series of adaptations, all of which tend to decrease the oxygen-pressure difference between the environmental air and the cells. Increased pulmonary ventilation raises alveolar oxygen pressure but lowers alveolar carbon dioxide pressure. To counteract the resultant respiratory alkalosis, base is excreted by the kidney, thus restoring the arterial pH to normal at a lower level of alkaline reserve. Cardiac output increases as does the oxygen-carrying power of the culculating blood. This enables the delivery of more oxygen per unit of time to tissues. These changes make possible heavy work by acclimatized men at altitudes that cause rapid loss of consciousness in unadapted subjects. Symptoms of oxygen lack and acapnia can be avoided in an unacclimatized subject by controlled voluntary hyperventilation. Personal experiences in mountain climbing and as a subject in low pressure chamber ascents are included. (In part from the author's conclusions)

4378
HOW ARDC ACCOMPLISHES HUMAN FACTORS RESEARCH AND DEVELOPMENT. — U. S. Air Force Medical Service Digest, 6 (3): 2-7. March 1955. DLC

The organizational structure, facilities, and resources of the Air Research and Development Command with regard to human factors research are described.

4379
Howard, L. P.,
D. Paul, and R. J. Shephard
RADIOACTIVE SODIUM CLEARANCE DURING PRESSURE BREATHING. — RAF Inst. of Aviation Medicine (Gt. Brit.), Farnborough; issued by Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 938, Nov. 1955. 12 p. AD 81 808 UNCLASSIFIED

Factors influencing the clearance of radioactive sodium ($Na_2{}^{24}CO_3$) from an intramuscular depot are considered in relation to pressure breathing. Observations on three normal subjects for brief periods of pressure breathing at pressures of 78 and 107 mm. Hg show a 79% increase in the clearance curve during pressure breathing. Immediately following pressure breathing, a rapid decrease in radioactivity count occurs as the result of a clearance of radioactive material from the superficial veins. The clearance corresponds with about a 100% increase of venous flow for a period of 1 1/2 minutes, which would indicate a dispersal of 4.5 ml./100 ml. of pooled venous blood. A comparison of these findings with previous studies of venous pooling and intramuscular temperature suggests that (1) the capacity vessels are filled as much by way of the metabolic capillaries as by way of the arteriovenous anastomoses, and (2) these capillaries participate in the vasodilatation that characterizes the initial phase of pressure breathing. (AD abstract)

4380
Hoyt, J. R.
MORE ON NIGHT FLYING. — Flying 56 (1): 34-35; 64. Jan. 1955. DLC (TL501.P6, v. 56)

For safe and efficient night flying, the following suggestions are made: (1) instrument flight be used whenever the horizon is obscure; (2) red bulbs be used in the cockpit and in flashlights rather than blinding white light; (3) instead of intent staring, the pilot should keep his eyes in constant motion and look slightly to one side of an object; (4) to prevent fumbling in the cockpit, pilots should memorize the position of instruments, switches, and levers; and (5) a flight plan should be prepared and on hand.

4381
Hrůza, Z.,
and P. Fábry
STUDIES ON THE ADAPTATION OF METABOLISM. II. ADAPTATION OF PROTEIN METABOLISM UNDER VARYING CONDITIONS OF NUTRITION. — Physiologia bohemoslovenica (Praha), 4 (2): 152-154. 1955. In English, with Russian summary (p. 154). DLC (QP1.C417, v. 4)

Female rats accustomed to fasting showed an increase in liver protein formation in comparison to non-fasting control animals. Following a forty-eight hour fast, approximately the same amount of protein was released from the liver of both fasting and control animals. These experiments demonstrate the successful adaptation of protein metabolism during fasting.

4382
Hudson, G. G.
AIRCRAFT EJECTION SEAT. — Reconstruction Finance Corp., Washington, D. C. U. S. Patent 2,773,661. Dec. 11, 1956. 4 leaves. DP

An ejection seat mechanism has been designed which provides (1) a device to tilt or raise the seat bottom during the ejection sequence to withdraw the pilot's feet from the aircraft controls, and (2) a thigh hold-down strap which is automatically tightened when the seat bottom is elevated.

4383
Hultgren, G. V.
[A NEW EARPLUG] Ett nytt hörselskydd. — Svenska läkartidningen (Stockholm), 52 (8): 487-490. Feb. 25, 1955. In Swedish. DNLM

A vinyl-plastic earplug (Filterphon) developed for the personal protection of hearing of persons working in noisy industries is described and illustrated. The earplug is effective in areas with a noise intensity up to 120 decibels.

4384
THE HUMAN FACTORS PROGRAM IN ARDC. — U. S. Air Force Medical Service Digest, 6 (3): 9-26. March 1955. DLC

The research and development program of the U. S. Air Force is described as it operates in the following areas: (1) personnel research, (2) protective environment research, (3) research in performance improvement and human factors in range extension, (4) escape and survival research, (5) aircraft medical and sanitation equipment research, (6) protection against ground environmental hazards, and (7) performance improvement and human factors in ground systems research. The test program encompasses engineering evaluation, functional evaluation, operational stability testing and field tests of competing items of equipment in operational commands.

4385
(Human Relations Research Group)
MOTIVATIONAL FACTORS IN PRODUCTIVITY. — Univ. of Calif. Human Relations Research Group, Los Angeles (Contract Nonr-233(09)); issued by Office of Naval Research, Washington, D. C. Final Technical Report, April 30, 1955. 3+26 p. AD 71 328 PB 124480

Research conducted from 1951 to 1954 by the Human Relations Research Group of the University of California, Los Angeles, in an interdisciplinary program of investigation concerned with the measurement of human variables in effective group functioning is discussed by reference to papers on various aspects of the program which have been or are to be published. Papers reporting work conduct-

ed in the following general areas are summarized: (1) social structure and its correlates, (2) social sensitivity, (3) criteria and evaluation of performance, and (4) leadership training and its evaluation.

4386
Humphreys, L. G.
THE IMPORTANCE OF APTITUDE TESTS IN THE SELECTION OF AIR FORCE PERSONNEL. — Amer. Scientist, 43 (1): 100-105; comments by L. S. Kubie, p. 105-108. Jan. 1955.
DLC (LJ85.S502, v. 43)

The predictive value of aptitude tests for success in pilot training is discussed. Certain limitations of the stanine score are explained. The chief sources of prediction errors lie in (a) the select nature of the applicant group in respect to aptitude, (b) the degree of unreliability inherent in the criterion, and (c) the inadequacy of the aptitude battery. However, in view of the demonstrated predictive value of aptitude tests for selection over that of more subjective holistic approaches, such as interviews, the author defends the need for application of aptitude testing for selection of future scientists.

4387
Hunsicker, P. A.
ARM STRENGTH AT SELECTED DEGREES OF ELBOW FLEXION. — Univ. of Michigan, Ann Arbor (Contract AF 18(600)-43); issued by Wright Air Development Center. Aero Medical Lab., Wright Patterson Air Force Base, Ohio. WADC Technical Report no. 54-548, Aug. 1955. vii+58 p. (Project no. 7214). AD 81 792 UNCLASSIFIED

The arm strength of subjects comparable in age and body type to aircrew members was measured by the Kinematic Muscle Study machine in the sitting and prone positions. The following observations were made: (1) strength varied widely among individuals of similar body type; (2) the average strength of the left arm was 10% less than that of the right arm; (3) flexion of the elbow progressively decreased strength; (4) the decreasing order of force applied in the sitting position was push, pull, up, down, adduction, and abduction; (5) the decreasing order of force applied in the prone position was pull, push, up, adduction, down, and abduction; (6) greater strength was exhibited in the sitting position in all cases; (7) at 120° of elbow flexion, nine maximum (mean) efforts and only one minimum effort were achieved. (165 references)

4388
Hurtado, A.
[MAN IN HIGH ALTITUDE HABITATS] El hombre en las grandes alturas habitadas. — Anales de la facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Peru), 38 (1): 9-16. 1955. In Spanish. DNLM

In comparison to persons living at sea level (Lima, Peru, 500 feet), persons living at high altitude (Morococha, Peru, 14,900 feet) demonstrated the following: (1) reduced partial pressure of oxygen in the trachea, alveoli, and capillaries; (2) shorter stature, lack of obesity and greater thoracic breadth; (3) hyperventilation phenomenon; (4) polycythemia, increase in the total volume of circulating blood, and an increase in hematopoietic activity; (5) arterial blood changes, and (6) an increase in heart size.

4389
Hurtado, A.
PATHOLOGICAL ASPECTS OF LIFE AT HIGH ALTITUDES. — Military Med., 117 (3): 272-284. Sept. 1955. DLC (RD1.A7, v. 117)

A review is presented of studies on the natural acclimatization of native residents living in Morococha, Peru (altitude of 4,540 meters [14,900 feet]), and on the etiological role of anoxia in certain pathological conditions (pulmonary hypertension, chronic mountain sickness, polycythemia) observed at high altitudes. Included is a discussion on respiratory, circulatory, and physiopathological studies on normal residents and those with chronic mountain sickness.

4390
Hurwich, L. M.,
and D. Jameson
QUANTITATIVE ASPECTS OF AN OPPONENT-COLORS THEORY. — In: Office of Naval Research, Symposium on physiological psychology, p. 137-169. ONR Symposium Report ACR-1, March 10-11, 1955.
AD 80 100 UNCLASSIFIED

The theoretical formulation is presented for an opponent-colors theory on the basis of the color mixture and luminosity data for the standard observer. It also accounts for the attributes of spectral brightness, hue, and saturation and their psychophysical functions. Certain aspects of the dichromatic vision are examined; the effects of chromatic adaptation for normal color vision are briefly considered.

4391
Hussman, T. A.
THE RELATIONSHIP BETWEEN PSYCHOGALVANIC ACTIVITY AND PILOT PERFORMANCE UNDER SIMULATED INSTRUMENT FLYING CONDITIONS. — Publication no. 14,201. vii+108 p. Ann Arbor: University Microfilms, 1955.
DLC (Microfilm AC-1, no. 14,201)
Also issued (with T. A. Hussman and R. C. Hackman as authors) by: Naval Medical Research Inst., Bethesda, Md. Research Report, Sept. 26, 1955 (vol. 13: 581-620). (Project Report no. NM 001 056.08.02).
AD 85 859 UNCLASSIFIED

The relationship between skilled performance and the emotional activity which precedes, accompanies, or follows it was determined by measurement of the galvanic skin response (GSR) in 12 Navy pilots during eighteen 12-minute precision maneuvers under simulated full and partial instrument conditions (without attitude indicators). A low positive correlation was found between performance and mean GSR activity under normal full-instrument conditions. The partial panel condition produced significantly poorer performance and significantly greater GSR activity, reducing correlation essentially to zero. GSR activity was significantly greater before and after each maneuver than during the maneuver period. Both consistently positive and consistently negative correlations were seen in some individuals, indicating that emotional activity may be either facilitative or disruptive to pilot performance. (Quoted in part)

4392 1954
HYPOXIA ...? — U. S. Air Force Medical Service Digest, 5 (4): 13-15. April 1954. DLC

The importance of hyperventilation as a possible cause of unexplained aircraft accidents and "hypoxia" incidents is discussed. The hyperventilation syndrome is described and compared with the symptoms of hypoxia.

4393
IDENTIFICATION OF DECEASED AIR FORCE PERSONNEL BY BLOOD ANALYSIS. — U. S. Air Force Medical Service Digest, 6 (2): 5-6. Feb. 1955. DLC

Insufficiency of regular identification techniques in identification of the deceased through aircraft accidents led to the development of new techniques, especially the use of blood analysis far beyond the basic blood classification. Other methods employ anthropological evidence, reassembly of badly fractured mandibles, maxillae, and loose teeth, and special techniques for obtaining fingerprints on badly decomposed, mutilated, or burned fingertips.

4394
Ikegami, M.,
K. Takeuchi, M. Suzuki, M. Itoh, and S. Arilzumi
EFFECTS OF VARIOUS PREPARATIONS IN FATIGUE RECOVERY. — Japanese Safety Forces Med. Jour. (Tokyo), 2 (7-8): 25-42. July-Aug. 1955. In Japanese, with English abstract (p. 3-4). DNLM

An experiment was conducted to determine the effect of the injection of glucuronic acid, 7% $NaHCO_3$, or Vonmix (Vitamins A, B_2, B_6, D_2) on fatigue sustained during work tasks performed 30 minutes later. No significant difference was observed between treated and control subjects in fatigue determined by subjective symptoms, kinetic record, flicker index, Dawny-Kotake's method of will against action adjustment, Takano's method, Donaggio's reaction, or Ozawa's iodine starch method.

4395
THE IMPORTANCE OF THE HUMAN ELEMENT AS A CAUSE OF ACCIDENTS IN AIR TRANSPORT. — I. F. T. A. Bulletin (Paris), 1955 (10), article 160/R. 4 p. March 7, 1955. DLC (TL502.I49)

Pilot errors during the 1948 to 1951 period (C. A. B. statistics) were classified as (1) voluntary, (violation of regulations) or nonvoluntary errors occurring under routine conditions, (2) errors made under nonroutine conditions, and (3) errors on which adequate information was not available. Group (1) voluntary contributed 36% of the total errors, group (1) non-voluntary contributed 21%, and group (2) contributed 20% of the total. Most involuntary errors were due to neglect of a simple manipulation or to an inadvertent wrong control setting. Voluntary errors were chiefly reckless acts in defiance of regulations.

4396
Industrial Hygiene Foundation of America
AN ANNOTATED BIBLIOGRAPHY ON NOISE, ITS MEASUREMENT, EFFECTS AND CONTROL. — v+364 p. Pittsburgh: Industrial Hygiene Foundation of America, Inc., 1955. DNLM

An annotated bibliography is presented of representative literature concerning: (1) techniques, instruments, and surveys (interpretation) of the measurement of sound, noise, and hearing loss; (2) the general biological and occupational effects of noise; and (3) methods and examples of the reduction and control of noise.

4397
Internationale Gesellschaft für Biologische Rhythmusforschung
[PROCEEDINGS OF THE FOURTH CONFERENCE OF THE INTERNATIONAL SOCIETY FOR BIOLOGICAL RHYTHM RESEARCH (BASEL, 1953)] Verhandlungen der vierten Konferenz der Internationalen Gesellschaft für Biologische Rhythmusforschung (Basel, 1953). — Acta medica scandinavica (Stockholm), Suppl. 307. 199 p. 1955. DNLM

Pertinent papers presented at this conference are abstracted separately, see item no. 3747, 3771, 4105, 4353, 4643, 4655, 4799, 4852, 4990, and 5172.

4398
[Ireland, G.]
HYPOXIA UNSUSPECTED. — U. S. Naval Aero-Medical Safety Jour., 1 (3): 4-8, 19-20. Nov. 1955. DNLM

The work of Dr. George Ireland in the investigation of the occurrence of low-altitude hypoxia in helicopter flight is described. In experimental flights Dr. Ireland has experienced hypoxia at altitudes as low as 6500 feet. The phenomenon is tentatively attributed to oxygen deprivation caused by the lack of ram-air in hovering craft, the centrifugal pump effect of rotor action near the rotor hub, and oxygen competition and/or exhaust reflux between the cockpit area and powerplant.

4399
Iriarte, D. R. 1954
[EAR PROBLEMS IN PILOTS AND PASSENGERS] Problemas del oído en pilotos y pasajeros. — Ciencia aeronáutica (Caracas), 1 (1): 40. Sept. 1954. In Spanish DLC

The problems of aerotitis media and barotrauma in aviation medicine are briefly discussed. These conditions can be prevented in pilots by periodic ear examination, and susceptible persons can be recognized during the selection examination. Diagnostic and therapeutic measures are briefly noted.

4400
Isaakian, L. A.
[SEASONAL CHANGES IN CHEMICAL THERMOREGULATION AND IN THE SPECIFIC COURSE OF NUTRITION IN HETEROTHERMIC ANIMALS] O sezonnykh izmeneniiakh khimicheskoĭ termoreguliatsii i spetsificheskogo dinamicheskogo deĭstviia pishchi u geterotermnykh zhivotnykh. — Fiziologicheskiĭ zhurnal SSSR (Moskva, Leningrad) 41 (2): 210-218. March-April 1955. In Russian. DLC (QP1.F57, v. 41)

Tests made with hibernating mammals (Erinaceus and Citellus) over a period of one year showed the functional states of the thermoregulation apparatus changed to accord with the seasonal temperature variations in a manner specific to each of the animal species studied. It is concluded that the recorded seasonal shifts in thermoregulation and gaseous metabolism depended upon a number of factors, among which the intero-exteroceptive interactivity related to nutritional and temperature reactions played an important part. Specific changes in the functional state of the thermoregulation apparatus and the specific vital effect of nutrition observed in the animal species studied through all seasons of the year pointed to the fact that nervous (reflex) mechanism played an important role in the appearance of a heterothermic [hibernating] state.

4401
IT'S A TOSS. — Aircraft (Toronto), 17 (7): 15. July 1955. DLC (TL501.A56143, v. 17)

A practice seat-ejection tower designed to train RCAF airmen in the technique of emergency escape from jet fighters is described. Trainees are propelled by operation of a standard seat ejection mechanism at a speed of 50 ft./sec. (12-14 g) a distance of 55 feet up the 70^{o}-slanted tower.

4402
Ivanoff, A.,
and C. Bourdy
[ON THE EXISTENCE OF NIGHT BINOCULAR CONVERGENCE] Au sujet de l'existence d'une convergence binoculaire nocturne. — Comptes rendus de l'Académie des sciences (Paris), 238 (14): 1537-1539. April 5, 1954. In French. DLC (Q46.A14, v. 238)

A study of binocular convergence in night vision showed that at decreasing low luminances binocular convergence tends towards a limited value which is apparently smaller in hypermetropic subjects. It is suggested that night presbyopia may be explained by a lack of convergence, and night myopia by an increase in convergence at low luminances.

4403
Ivanoff, A.,
and C. Bourdy
[ON THE INCREASE IN THE VALUE OF NIGHT MYOPIA AT LEVELS BELOW 10^{-3} CD./M^2.] Au sujet de l'augmentation de la valeur de la myopie nocturne aux niveaux inférieurs à 10^{-3} cd/m^2. — Optica acta (Paris), 1 (4): 192. Feb. 1955. In French. DLC (QC350.O53, v. 1)

A decrease in illumination from 10^{-3} to 5.10^{-5} candles per sq. meter was observed to increase night myopia less than 0.25 diopters in subjects with slight night binocular convergence, more than 0.5 diopters in subjects with a convergence of approximately 2 diopters, and more than 1 diopter in a subject with high convergence. The relationship between binocular convergence and accommodation at illuminations below 10^{-3} cd./$m.^2$ is thus confirmed.

4404
Ivanoff, A.,
and C. Bourdy
[ON THE BEHAVIOR OF BINOCULAR CONVERGENCE IN THE ABSENCE OF A POINT OF FIXATION] Au sujet du comportement de la convergence binoculaire en absence de point de fixation. — Comptes rendus de l'Académie des sciences (Paris), 241 (1): 103-105. July 4, 1955. In French. DLC (Q46.A14, v. 241)

A fine-grained roughened glass was placed 10 cm. before the eyes of experimental subjects, blocking the visual field, and eliminating accommodation and fusion reflexes. The value of binocular convergence for illuminations of 0, 4, 20, and 40 cd./$m.^2$ was then recorded. Similar values were obtained for all illuminations, thus establishing a correlation between night myopia and empty-field myopia.

4405
Ivanoff, A.
NIGHT BINOCULAR CONVERGENCE AND NIGHT MYOPIA. — Jour. Optical Soc. Amer., 45 (9): 769-770. Sept. 1955. DLC (QC350.Q6, v. 45)

Binocular convergence was studied in nine subjects under luminances of 1 to 10^{-6} c./$m.^2$ at test distances of 20 cm. or 150 cm. Convergence was found to approach a limiting value independent of test distance at 10^{-3} c./$m.^2$. No correlation was seen to exist between the limiting value and photopic heterophoria, but some correlation was suggested with ametropia, since the limiting convergence decreased for hyperopic subjects and increased for myopic ones not wearing glasses constantly. The hypothesis that night accommodation as well as night convergence begins in non-presbyopic subjects at about 10^{-3} c./$m.^2$ was tested by measuring night myopia in 7 subjects. Below 10^{-3} c./$m.^2$ the increase in night myopia was less in subjects with slight night binocular convergence than for subjects with greater convergence. Thus for luminances below 10^{-3} c./$m.^2$ the mechanism of night myopia was seen to be chiefly that of binocular night convergence, acting by increasing the curvature of the lens.

4406
Jandris, J. T.
AIRCRAFT EJECTION SEAT. — The Glenn L. Martin Co., Middle River, Md. U. S. Patent 2,709,556. May 31,1955. 7 leaves. DP

An ejection seat mechanism is described which provides sequential actuation of a plurality of ejection control levers forming a part of the arm rests, and movable arm rests adapted to allow easy access to the seat.

4407
Jänkälä, E. O.,
and E. K. Näätänen
ADAPTATION OF THE TESTES TO MODERATE PSYCHIC STRESS: AN EXPERIMENTAL STUDY OF PERMANENT LESIONS AND RECOVERY IN THE TESTES OF RATS DURING PERIODS OF MODERATE PSYCHIC STRESS AND SUBSEQUENT REST. — Suomalaisen tiedeakatemian toimituksia (Annales Academiae scientiarum fennicae) (Helsinki), Series A, V (Medica-anthropologica), no. 51. 1955. 13 p. In English. DNLM

Microscopic examinations were made of the testes of rats exposed daily for 1 to 12 weeks to moderate psychic stress produced by bright flashes of light and loud noises. After an initial period of hyperfunction, a general degeneration and destruction of the tubules and disappearance of spermatozoa were observed. After 7-8 weeks (presumably after adaptation) or after withdrawal from stress conditions, normal spermatogenesis was resumed in the remaining intact tubules.

4408
Jänkälä, E. O.,
and E. K. Näätänen
THE EFFECT OF INTENSE PSYCHIC STRAIN ON THE RENAL STRUCTURE. — Suomalaisen tiedeakatemian toimituksia (Annales Academiae scientiarum fennicae) (Helsinki), Series A, V (Medica-anthropologica), no. 47. 12 p. 1955. In English. DNLM

Rats exposed for periods of 10 to 110 days to psychic stress produced by flashes of brilliant light and sudden loud noises showed changes in the kidneys resembling those of the initial stages of nephrosclerosis. The mean weight of the kidneys increased from 312 mg./100 g. body weight in control animals to 450 mg./100 g. body weight. A subcapsular ischaemic necrobiotic zone was observed, with thickening and hyalinization of the walls of the arterioles, thickening of the basement membranes and the capillary walls of the glomerular tufts, and degeneration of the tubular epithelium.

4409
Jankowski, W.,
and S. Iwankiewicz
[HEARING IN ACUTE OXYGEN DEFICIENCY] Słuch w ostrym niedoborze tlenowym. — Otolaryngologia polska (Warszawa), 9 (1): 15-23. 1955. In Polish, with English summary (p. 22-23). DNLM

Hearing thresholds were not modified in 71 pilots exposed to a simulated altitude of 6,500 meters in a decompression chamber. After exposure to sound intensities of 60 and 80 decibels for 5 minutes, 25 pilots showed an average increase of 10 decibels in their hearing threshold, which returned to normal within 20-60 seconds. Under anoxic conditions, with a sound intensity of 80 decibels for 5 minutes, an average decrease of 27.6 decibels in hearing was noted, which was compensated after 3 minutes. (Authors' summary, modified)

4410
Jasper, R. L.
PROGRESSIVE CHANGES IN TISSUE RESPIRATION DURING STRESS. — Publication no. 13,934. Ann Arbor: Univ. Microfilms, 1955. x+93 p. DLC
Abstract in: Federation Proceedings, 14 (1[I]): 485. March 1955. DLC (QH301.F37, v. 14)

An investigation was conducted to determine the effects of cold exposure (2°C.), heat exposure (38°C.), and formaldehyde administration (by intraperitoneal injection) on the oxygen uptake of the liver, kidney, and brain tissues of mice. Oxygen uptake of tissue slices was determined by the Warburg constant volume respirometer method. Exposure to cold for 6 hours produced a slight decrease in the oxygen uptake of liver and kidney and a slight increase in the uptake of brain tissue. After exposure for 48 hours the uptake of all three tissues was significantly depressed. At 72 hours uptake was above control values but returned to normal thereafter. Heat exposure caused similar changes in oxygen uptake except for the initial and terminal stages. Formaldehyde had no apparent effect (other than that attributed to degeneration of enzyme systems) on tissue respiration. It is concluded that changes in metabolism during exposure to cold and heat represent a similar mechanism of adjustment to stress. (55 references)

4411
Jayle, G. E.,
R. Camo, R. Boyer, and A. Filippi
[SIGNIFICANCE OF THE INTELLECTUAL LEVEL IN THE "PSYCHO-SENSORY" THRESHOLDS IN NIGHT VISION] Importance du niveau intellectuel sur les seuils "psycho-sensoriels" en vision nocturne. — Médecine aéronautique (Paris), 10 (3): 247-254. 1955. In French. DLC (TL555.M394, v. 10)

A possible correlation of intellectual level and night vision was investigated by determining visual thresholds among subjects of varying degrees of education. A filmed scene was gradually illuminated and thresholds of gross vision (the perception of light), differential vision (perception of relatively dark areas in the scene), morphoscopic vision (perception of a human silhouette) and identification (recognition of the scene) were determined. The first two thresholds of vision, considered to be dependent on sensory phenomena, and the third threshold, considered to involve intellectual or psychic elements, were similar in all groups. The fourth threshold, however, was significantly lower in subjects with at least secondary instruction. Factors to be considered in the analysis of results are the possible difference in mode of life, ease of expression, and psychic development between the groups studied.

4412
Jenkins, H. M.,
and J. E. Keith Smith
THE PERSISTENCE OF VISUAL SEARCH [Abstract]. — Amer. Psychologist, 10 (8): 450. Aug. 1955. DLC (BF1.A55, v. 10)

Forty airmen searched a display of 3,000 regularly spaced small holes in an area of 2 square feet for a target hidden behind a hole. Persistence was measured by the time spent in search before reporting "no target" or a target. A watch lasted for two hours or a maximum of 40 trials. Four conditions were formed from two target frequencies used with or without knowledge of results. In all groups the persistence of search eventually declined from an initial level of approximately 200 sec. to an asymptotic level of approximately 90 sec. When knowledge of results was withheld, there was an initial increase in persistence on successive trials. The extent of this increase was much greater for the higher than for the lower target frequency.

4413
Jerger, J. F.
INFLUENCE OF STIMULUS DURATION ON THE PURE-TONE THRESHOLD DURING RECOVERY FROM AUDITORY FATIGUE. — Jour. Acoust. Soc. Amer., 27 (1): 121-124. Jan. 1955.
DLC (QC221.A4, v. 27)

Also issued as report: Northwestern Univ., Evanston, Ill.; issued by School of Aviation Medicine, Randolph Field, Tex. Report no. 55-19, June 1955. 8 p. AD 72 200 UNCLASSIFIED

The time-intensity relationship for threshold during the course of recovery from auditory fatigue was investigated by exposing 12 normal ears to thermal noise at an overall SPL of 110 db. for 2 minutes, then studying the resultant shift in the threshold for short tones of three durations (500, 50, and 5 msec.). Thirty seconds after the termination of the noise, the pre-exposure intensity differential among these three short-tone durations was markedly reduced. As postexposure time increased, the decline in the degree of temporary hearing loss was accompanied by a gradual return to the pre-exposure time-intensity relationship. (Author's abstract)

4414
Jerger, J. F.,
and R. T. Carhart
PRELIMINARY REPORT ON A METHOD FOR THE RAPID MEASUREMENT OF THRESHOLD SHIFT FOLLOWING HIGH-LEVEL ACOUSTIC STIMULATION. — Northwestern Univ., Evanston, Ill.; issued by School of Aviation Medicine, Randolph Field, Tex. Report no. 55-64, Oct. 1955. 6 p. AD 90 697 UNCLASSIFIED

A test procedure is described which was designed to obtain a relatively rapid index of threshold shift by measuring the amount of time required for the threshold to return to certain fixed levels above its prestimulation value. Administration of this test to 68 normal ears yielded a distribution of results suggesting two distinctly different kinds of response. The majority of subjects showed a relatively rapid pattern of recovery, but, in a small minority, recovery was markedly less rapid. The test results of some subjects within this latter group tended to show marked fluctuations from day to day. The implications of these findings for the problem of predicting noise susceptibility are discussed. (Authors' summary)

4415
Jerger, J. F.,
C. Lightfoot, and R. Carhart
SOME EFFECTS OF SHORT HIGH-LEVEL SOUNDS UPON AUDITORY THRESHOLD. — Northwestern Univ., Evanston, Ill.; issued by School of Aviation Medicine, Randolph Field, Tex. April 1955. 8 p. (Project no. 21-1203-0001, Report no. 9). AD 80 075 UNCLASSIFIED

The threshold shift for 3000 and 4000 c.p.s. pure tones was measured at intervals of 60, 140, 500, 1025, and 3025 milliseconds following the termination of a 2-second, 111-decibel blast of either a 2000-c.p.s. pure tone or thermal noise. Results suggest that threshold shifts measured at intervals greater than 400 msec. following termination of the blast hold more promise as indices of noise-susceptibility than threshold shifts measured at intervals less than 400 msec. (School of Aviation Medicine abstract)

4416
Jerison, H. J.
EFFECT OF A COMBINATION OF NOISE AND FATIGUE ON A COMPLEX COUNTING TASK. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-360, Dec. 1955. v+25 p. (Project no. 7193, Task no. 71610). AD 95 232 UNCLASSIFIED

To study effects of environmental stress on human performance, tests showing orderly performance changes under such conditions have to be developed. This report presents a detailed description and analysis of performance changes on a promising test involving keeping a complex mental count. Subjects worked on the test continuously for two hours, and during the second and third half hours of the work period, noise of about 110 db. over-all sound level was present. Performance changes, although presumably related to both noise and fatigue, are analyzed in terms of the characteristics of the test — time at work and required counting rate — and not in terms of the environmental stress. (Author's abstract)

4417
Jerison, H. J.,
and Arden K. Smith
EFFECT OF ACOUSTIC NOISE ON TIME JUDGMENT. — Antioch Coll., Yellow Springs, Ohio (Contract AF 18(600)-50); and Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-358, Oct. 1955. iv+12 p. (Project no. 7193, Task no. 71614). AD 99 641 UNCLASSIFIED

Fourteen volunteer male undergraduates with normal hearing were asked to press a telegraph key at ten-minute intervals while working on another job that kept them almost completely occupied. In a two-hour control session the over-all noise level was about 77.5 db. In another two-hour experimental session the first half hour was in the 77.5 db. noise field and the last one and one-half hours were in an over-all noise field of about 111.5 db. The lower noise level served as a measure of performance under "normal" conditions and also to mask extraneous laboratory noises, and the higher noise level provided the experimental condition studied. It was found that under quiet conditions subjects responded about every nine minutes on the average. Under noise conditions subjects responded about every seven minutes. The difference between time judgments in noise and quiet was significant at the .02 level. It is concluded that noise effects time judgments as measured in this experiment. The results are discussed in terms of effect of motivation on time judgment and in terms of a neural model for the construction of subjective time involving the normal activity of the central auditory nervous system. (Authors' abstract)

4418
Jernigan, J. P.,
J. C. Cooley, W. L. Peterson, and C. E. Engel

SPLENIC INFARCTS ASSOCIATED WITH HYPOXIA. — Jour. Aviation Med., 26 (1): 29-34. Feb. 1955. DLC (RC1050.A36, v. 26)

Splenic infarction following high-altitude flight has been observed in 11 patients. The symptoms in all cases were initiated by pain in the upper abdomen within four hours after takeoff, and this was uniformly followed by nausea and vomiting. Examination routinely revealed left upper quadrant tenderness and left costovertebral angle tenderness. The peritoneal rebound phenomenon was frequently present within forty-eight hours. All patients had elevated white blood cell counts which increased with a rising temperature when the process progressively became worse. Positive tests for the sicklemia trait were obtained in seven cases. Roentgenographic studies frequently aided in the diagnosis by showing localized left upper quadrant ileus, but spenic enlargement could not always be demonstrated. Although splenectomy is most frequently necessary in the treatment of such cases, it is believed that such a decision can be made within forty-eight hours' observation. (From the authors' summary)

4419
JET-ENGINE NOISE—INTERMITTENT EXPOSURE. — Air Defense Command Surgeon's Bulletin, 2 (1): 26-27. Feb. 1955. DNLM

Bi-monthly tests of auditory threshold revealed no significant threshold change during a four-year period in 132 men working with ear-plug protection on the final ground check of jet engines.

4420
Johnson, C.,
and G. R. Wendt
STUDIES OF MOTION SICKNESS. XVII. THE EFFECTS OF TEMPERATURE, POSTURE, AND WAVE FREQUENCY UPON SICKNESS RATES. — Jour. Psychol., 39 (2): 423-433. April 1955. DLC (BF1.J67, v. 39)

This study investigated the extent to which motion sickness rates on the vertical accelerator are affected by two temperatures, by four combinations of head and body postures, by five different waves, and by three classes of susceptibility. A total of 120 subjects were used. Each was blindfolded and subjected to motion for 20 minutes or less if vomiting occurred. The results were evaluated on the basis of a sickness index which assigned single weight to nausea and double weight to vomiting. There was no significant difference between sickness rates at warm temperature (86° F.) and cool temperature (65° F.) The sickness index for one position—seated with head back—was nearly twice that for the other positions. Analysis of the interrelations of the effect of body position, temperature, and type of wave suggests that a simple mechanical action of wave motion on blood distribution was not a factor in production of motion sickness. Previous history of motion sickness gave a fair prediction of sickness on the vertical accelerator. Waves at 26 cycles per minute were above the optimum frequency (22 cycles) for production of motion sickness.

4421
Johnson, L. C.,
and J. A. Stern
RIGIDITY ON THE RORSCHACH AND RESPONSE TO INTERMITTENT PHOTIC STIMULATION. — Jour. Consulting Psychol., 19 (4): 311-317. Aug. 1955. DLC (BF1.J575, v. 19)

The Rorschach was administered to 117 students and compared with their recorded subjective sensations during intermittent photic stimulation. The Rorschachs were scored for rigidity according to Fisher's technique. The subjective sensations were scored independently utilizing an a priori criterion for dividing the sample into two groups, perceptually rigid and perceptually flexible. The perceptually flexible group had significantly lower Rorschach rigidity scores, gave significantly more responses, more movement responses, took less time per response, and had a significantly lower average reaction time. In contrast to findings reported to date, F% and F+% did not significantly differentiate the two groups. Neither of the two perceptual rigidity-flexibility measures was related to intelligence-test scores or to a measure of anxiety proneness. The significance of these findings is discussed and alternative hypotheses are suggested. (From the authors' summary and conclusions)

4422
Johnson, W. H.
HEAD MOVEMENTS AND MOTION SICKNESS. — Internat. Record Med., 167 (12): 638-640. Dec. 1954. DLC (RM11.M745, v. 167)

Laboratory experiments are briefly reviewed which demonstrate the individual differences in susceptibility to motion sickness as dependent upon concomitant movements of the subject's head in response to movements imposed on the body as a whole. A new laboratory apparatus devised as a controlled means of inducing motion sickness is described and illustrated. It is concluded that restriction of head movement is a therapeutic measure in the prevention of all forms of motion sickness.

4423
Jones, M. E.
HUMAN ENGINEERING GETS RID OF CONTROL TOWER CLUTTER. — Aviation Age, 24 (6): 186-191. Dec. 1955. DLC (TL501.A8187, v. 24)

The control tower at North Island Naval Air Station San Diego, Calif., was redesigned as an experimental study in human engineering. Improvements in field of vision, illumination, ventilation, location of functional areas, the control console, and the speaker system increased the efficiency and flexibility of the control operation, and decreased fatigue among personnel.

4424
Jones, Marshall B.
ASPECTS OF THE AUTONOMOUS PERSONALITY. V. TRAITS FROM THE THURSTONE TEMPERAMENT SCHEDULE, AND VI. THE PENSACOLA Z SCALE. — Naval School of Aviation Medicine, Pensacola, Fla. Report no. 001 108 109.04, June 15, 1955. iii+[24] p. AD 73 950 UNCLASSIFIED

The first study reports evidence in confirmation of earlier findings that the heteronomous individual is socially extraverted, anxious, and impulsive. These results were obtained from the joint administration of the California F Scale and the Thurstone

Temperament Schedule. The second study describes the construction and validation of the Pensacola Z Scale. This instrument is a modification of the California F Scale but differs from the F Scale in being free as possible of sociopolitical content. (Author's abstract)

4425
Jones, Marshall B.
AUTHORITARIANISM AND INTOLERANCE OF FLUCTUATION. — Jour. Abnormal and Social Psychol., 50 (1): 125-126. Jan. 1955. DLC (RC321.J7, v. 50)

Same as the item no. 2977, vol. III.

4426
Jones, Marshall B., and J. H. Manhold
AUTHORITARIANISM AND PHYSICAL FITNESS. — In: Research notes from the Aviation Psychol Lab., p. 20-26. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 108 109.02, March 15, 1955. AD 74 676 UNCLASSIFED

The relation between authoritarianism (submission to dictates of external agency) and physical fitness was investigated in naval air cadets by correlation of scores obtained on the California F Scale, form 40-45, with (1) step test performance early in Pre-Flight School, (2) step test performance at the end of Pre-Flight School, and (3) discrepancy between the step scores as a measure of the physical condition of incoming cadets relative to their capacity performance. Analysis showed that the capacity performance (highest score) of nonauthoritarians, who in general come from a higher socioeconomic level and have higher scholastic aptitude, was superior to that of authoritarians, that performance of nonauthoritarians was improved more during physical training in Pre-Flight School, and that in normal circumstances (before Pre-Flight) the nonauthoritarian was in poorer physical condition relative to his capacities than was the authoritarian.

4427
Jongbloed, J.
[MAN, THE ESSENTIAL IN THE MACHINE] De mens, het essentiële in de machine. — De vliegende hollander (Amsterdam), 11 (11): 359-360. Nov. 1955. In Dutch. DLC (UG635.N4V45, v. 11)

The progress of aviation medicine over the past 30 years toward solution of a number of problems is briefly reviewed. The possibility of future space flight has opened up a new field of space medicine which has to cope with the physiological and psychological problems of space in addition to those of flight.

4428
Jongbloed, J.
[SPACE-FLIGHT MEDICINE] Ruimtevaart-geneeskunde. — Aeromedica acta (Soesterberg, Netherlands), 4: 11-17. 1955. In Dutch, with English summary (p. 17). DNLM
Also published in: Folia psychiatrica neurologica et neurochirurgica neerlandica (Amsterdam), 58 (4): 247-253. Aug. 1955. In Dutch, with English summary (p. 253). DNLM

Differential development of aviation medicine and space medicine is emphasized; while aviation medicine followed aerotechnological advances as new physiological problems arose, space medicine must of necessity precede actual space travel and anticipate biological problems. The author surveys current knowledge of physiological, neurological, and psychological problems that will be encountered in space flight.

4429
Jonge, T. E. de
[THE PLACE OF DENTISTRY IN AVIATION MEDICINE] De plaats der tandheelkunde in de luchtvaartgeneeskunde. — Aeromedica acta (Soesterberg, Netherlands), 4: 73-77. 1955. In Dutch, with English summary (p. 77). DNLM
Also published in: Nederlandsch tijdschrift voor geneeskunde (Amsterdam), 99 (36): 2642-2645. Sept. 3, 1955. In Dutch, with English summary (p. 2645). DNLM

Various causes of aerodontalgia are surveyed. It is recognized that factors such as rapid decompression, extreme cold, high g forces, and aeroembolism are not encountered in the regular flight. Oxygen saturation of 80% is needed to prevent anoxemic tissue destruction and pulpitis. Ultrasonic vibrations in supersonic flight and bruxism during physical and emotional tension, fear or cold also have an injurious effect on teeth. The etiology of aerodontalgia of high altitudes also includes active caries, apical abscesses, ascent to high altitudes within 48 hours after an extraction, defective fillings, as well as unwise choice of filling material which irritates the pulp. Conservative and replacement dentistry is advocated for pilots to preserve the anatomical balance between the upper and lower jaws.

4430
Kafka, M. M.
THE AVIATOR'S EYE PROBLEM. — Med. Times, 83 (5): 502-506. May 1955. DLC (R11.M8558, v. 83)

A brief review is presented of the flight surgeon's role in the early detection of visual errors (myopia, hyperopia, astigmatism), and of eye diseases of the pilot (including the ocular complications of measles, respiratory disorders, hypertension, hyperthyroidism, diabetes mellitus). Ocular problems frequently encountered by pilots (e. g. snow blindness, or eye disturbances during bad weather or night flying) are briefly reviewed. The importance of detecting early presbyopia and glaucoma in pilots over 40 years of age is stressed, and the diagnostic value of laboratory and X-ray assistance noted.

4431
Kahn, A.
SOME HUMAN ENGINEERING PROBLEMS IN FLY BY WIRE TECHNIQUES. — In: Aeronautical Electronics Digest, 1955 (National Conference on Aeronautical Electronics, Dayton, Ohio, 1955), p. 204-205. DLC (TL693.A3, 1955)

In view of the development of aircraft capable of flying at supersonic speeds it will be necessary to introduce control systems which will assist the pilot

in moving the control surfaces of the aircraft against the aerodynamic forces. It is possible that there will be no mechanical connections between the joystick and the control surfaces and that a movement of the joystick will give an electrical signal for the activation of some device which will operate the surfaces. It will be necessary to provide some kinesthetic feedback (an artificial feel system) from the control stick to the pilot to inform him of the forces set in action. This feedback should be proportional to the change of aircraft attitude rather than to a change in acceleration.

4432
Kaiser, H. K.
[PHYSICAL AND LIFE CONDITIONS ON OTHER PLANETS] Physische Verhältnisse und Lebensbedingungen auf anderen Planeten. — In: Probleme aus der astronautischen Grundlagenforschung [International Astronautical Congress, 3rd (Stuttgart, 1952), Proceedings], p. 226-238. Stuttgart, 1952. In German, with English summary (p. 226).
DLC (TL787.I44, 3rd, 1952)

Fundamental environmental conditions necessary for the existence of life include the presence of CO_2, water, free atmospheric oxygen, chemicals which form the basis of protoplasm, atmospheric pressure, and permissible conditions of gravity. The atmospheric and thermal conditions on the planets and moons of our solar system are examined in regard to the possibility of supporting either native life or that of astronauts on space flights. Modern astrophysical methods of colorimetry, spectrum analysis, photoelectric and thermoelectric techniques, radar, and polarisation research indicate that organic life is probable only on Mars and may possibly develop on Venus in the future. Higher forms of life cannot be maintained anywhere but on the Earth unsupported by technology.

4433
Kajornboon, S.
AIR SICKNESS. — Royal Thai Air Force Med. Gaz. (Bangkok), 4 (1): 35-40. Feb. 1955. In Thai, with English summary (p. 40). DNLM

The etiology of air sickness is discussed in relation to the physical and mental status of susceptible persons, and to the flight weather conditions. The symptoms and prevention of this disorder are also noted. (Author's abstract, modified)

4434
Kajornboon, S.
DIET AND NUTRITION. — Royal Thai Air Force Med. Gaz. (Bangkok), 4 (2): 155-159. April 1955. In Thai, with English summary (p. 159) DNLM

The following points are emphasized in a discussion of nutrition and flying: (1) ingestion of gas-producing foods is not recommended as gas expansion within the body during flight at low atmospheric pressure may cause discomfort; (2) vitamin-rich, easily digested, high-energy foods are recommended, and (3) food should be served at four-hour intervals, as hunger decreases the ability to fly, and in less quantity. (Author's abstract, modified)

4435
Kalmykov, P. E.,
and F. T. Eronin
[PHYSIOLOGICAL STANDARDS OF WATER CONSUMPTION DURING EXPOSURE TO HEAT] O fiziologicheskikh normakh vodopotrebleniia v usloviiakh znachitel'noĭ teplovoĭ nagruzki. — Fiziologicheskiĭ zhurnal SSSR (Moskva), 41 (4): 547-553. July-Aug. 1955. In Russian. DLC (QP1.F57, v. 41)

Laboratory observations and field studies failed to support the commonly prevailing concept that water intake at high temperature and during intensive physical exercise was conductive to increased perspiration. The volume of sweat secreted was not entirely and solely related to the amounts of water ingested, but also intimately associated with the body heat balance. Similarly, the concept that water intake to the point of thirst satiation resulted in an enhanced water assimilation was not borne out. The amount of water taken in must accord with the temperature level and with the physical exertion.

4436
Kamakura, K.,
W. Kaijo, and A. Morikawa
EFFECTS OF SUBNARCOTIC DOSES OF ETHYL-URETHANE ON RESISTANCE TO SEVERE ANOXIA IN RATS. — Japan. Jour. Physiol. (Nagoya), 5 (1): 16-20. March 30, 1955. DNLM

Rats were injected (intraperitoneally or subcutaneously) with ethyl urethane, phenobarbital, chloralose, or morphine thirty minutes before being decompressed to a simulated altitude of 145 mm. Hg. Mean survival time of control rats was 1.9 minutes. Survival time of ethyl urethane-treated (0.05-1.0 g./kg.) animals was prolonged and over 60 minutes in the majority of cases. The survival time of phenobarbital-treated (0.05-0.2 g./kg.) rats was similarly prolonged and accompanied by a certain amount of respiratory inhibition. With chloralose (0.1 g./kg.), half of the rats survived over thirty minutes and displayed great respiratory inhibition. No increase in survival was observed in rats treated with morphine. Ethyl urethane appears capable of increasing the tolerance of rats to high altitude before narcotic effects on respiratory movements are noted—possibly resulting from a specific action on cell metabolism. On the other hand, increase of tolerance by barbiturates is associated with thier narcotic action.

4437
Kamin, L. J.
RELATIONS BETWEEN DISCRIMINATION, APPARATUS STRESS, AND THE TAYLOR SCALE. — Jour. Abnormal and Social Psychol., 51 (3): 595-599. Nov. 1955. DNLM

To test the hypothesis that the subject's anxiety (and thus performance) in a threatening experimental situation is a function of his familiarity with mechanical and electrical apparatus, 70 subjects were required to perform a discrimination task motivated by avoidance of shock. Familiarity with apparatus was measured by a test of mechanical information and aptitude. There were significant relations between mechanical aptitude and measures both of latency and frequency of responding, while Taylor's scale of Manifest Anxiety tended to be unrelated to performance. The pattern of inter-

correlations, and the fact that Taylor Scale score is related to mechanical aptitude, suggested the speculation that data of studies relating the Taylor Scale to eyelid conditioning may be attributable to the mechanical aptidude-Taylor scale relation, or "apparatus stress." (Author's summary)

4438
Kamrass, M.,
and K. D. Swartzel
EVALUATION OF THE NOISE FIELD AROUND JET-POWERED AIRCRAFT. — Noise Control, 1 (6): 30-39; 54. Nov. 1955. DLC (TA365.N6, v. 1)

A technique is discussed which permits the analysis and prediction of ground noise levels from jet-powered aircraft, and also for indicating flight patterns which will permit minimum noise levels for those areas requiring a minimum of noise annoyance. Attenuation of sound waves may be enhanced by: (1) distance effects associated with the inverse-square law; (2) air damping; (3) walls and ground; (4) wind; (5) temperature; and (6) turbulence. Graphs and charts are included on sound-pressure levels of six-engine B-47 airplanes; noise level rank; and noise levels (human tolerance criteria, community responses, maximum values of speech-interference levels).

4439
Kanter, G. S.,
and R. H. Lubinski
EFFECT OF HEAT ON INORGANIC PHOSPHATE REGULATION IN DOGS. — Amer. Jour. Physiol., 180 (3): 559-562. DLC (QP1.A5, v. 180)

Plasma and urine inorganic phosphate levels were studied in dogs exposed to an ambient temperature of approximately 48° C. under varying conditions of hydration. Inorganic phosphate levels were observed to decrease sharply in dogs exposed for four hours without water. A less severe decline was seen in dogs whose body temperature was lowered as a result of the administration of drinking water. Levels in dehydrated dogs returned to normal after their return to a cool temperature, indicating heat rather than dehydration to be the cause of low phosphate levels. Kidney function was impaired by heat, since the administration of high levels of KH_2PO_4 caused increased phosphate excretion. The decrease in urinary phosphate under heat stress was believed to be due to the decrease in plasma phosphate concentration, which in turn resulted from cellular phosphate-bicarbonate exchange occurring in compensation for the respiratory alkalosis caused by panting.

4440
Kanter, G. S.
HEAT AND EXCRETION IN MAN. — Jour. Applied Physiol., 7 (5): 533-536. March 1955. DLC (QP1.J72, v. 7)

Volunteers were exposed without water for 3 to 6 hours to desert-like environmental conditions (temperature 120°-130° F., relative humidity 10%-20%). Heavy sweating occurred rapidly and resulted in a total loss of up to 3% of body weight. A reduction in urine flow through a decrease in glomerular filtration rate and an increase in the antidiuretic activity of the posterior pituitary resulted in a relative conservation of water. The concentration of Na and Cl in urine decreased after more than 3 hours of exposure, while the excretion of K was increased. After 1-2 hours bicarbonate disappeared from the urine. An increasing excretion of phosphate resulted in a marked acidosis which was present also in the blood, and was considered to be metabolic in nature.

4441
Karpenko, A. G.,
and G. A. Skuridin
[CONTEMPORARY PROBLEMS OF SPACE FLIGHT] Sovremennye problemy kosmicheskikh poletov. — Vestnik Akademii nauk SSSR (Moskva), 25 (9): 19-30. Sept. 1955. In Russian. DLC (AS262.A627, v. 25)

A didatic presentation of the subject, which is in essence a restatement of material previously presented in a variety of scientific periodicals and other publications. No bibliography is appended.

4442
Karvonen, M. J.,
M. Kinnunen, and R. Kääriäinen
FLICKER FUSION FREQUENCY IN SAUNA-BATH. — Internationale Zeitschrift für angewandte Physiologie (Berlin), 16 (2): 129-132. 1955.

Flicker fusion frequency (FFF) was determined during exposure to high ambient temperatures in a Finnish sauna-bath. The FFF fell initially, but rose gradually to the pre-exposure level in 15 minutes. The FFF was not dependent on body temperature, and was not affected by rapid or gradual cooling. The initial decrease is attributed to the immediate reflex response of the cardiovascular system to a rapid rise in temperature.

4443
Katsh, S.
CREATINE-CREATININE EXCRETION IN COLD-EXPOSED RATS [Abstract]. — Jour. Clin. Endocrinol. and Metabolism, 15 (7): 864-865. July 1955. DLC (RC648.E45, v. 15)

Twenty-four hour urine samples from control-fed rats exposed to cold (4° C.) showed an increase in the excretion of creatine and a decrease in that of creatinine (by 40-50%). In rats fed betaine and glycocyamine, creatine excretion during each 24-hour period was unaltered during cold exposure. Creatinine excretion, however, was similar to that of the control-fed rats. Creatinuria has been related to thyroid stimulation. Histologically, the thyroids were intensely stimulated in the cold exposed groups. It appers that feeding precusors did not alter the creatinemia or affect the thyroid response resulting from cold exposure. (Quoted in part)

4444
Katz, L. N.,
A. M. Katz, and F. L. Williams
METABOLIC ADJUSTMENTS TO ALTERATIONS OF CARDIAC WORK IN HYPOXEMIA. — Amer. Jour. Physiol., 181 (3): 539-549. June 1955. DLC (QP1.A5, v. 181)

Metabolic changes during hypoxemia were studied in dog open heart preparations in which circulation was relatively intact and the operation of nervous and humoral mechanisms was maintained. Correlations were seen in the relationship of both cardiac oxygen consumption and cardiac work efficiency,

left cardiac output, and mean systemic arterial blood pressure. Cardiac efficiency was found to be independent of cardiac oxygen consumption, but increased when the arterial oxygen content was low. In individual experiments, exceptions to the correlation trends were noted; in several cases cardiac work increased with a fall in oxygen consumption or spontaneous changes in coronary flow occurred. The operation of mechanisms which are not dependent on circulatory hydrodynamics is therefore indicated.

4445
Katz, M. S.,
and S. D. S. Spragg
TRACKING PERFORMANCE AS A FUNCTION OF COURSE ILLUMINATION. — Jour. Psychol., 40 (1): 181-191. July 1955. DLC (BF1 J67, v. 40)

Tracking performance as a function of differing frequencies of intermittent course illumination, ranging from .5 to 4.0 flashes per second, yielded the following results: (1) differences in performance on sine wave and irregular courses were not statistically significant; (2) tracking error scores varied approximately inversely as the logarithm of illumination frequency, from .5 to 2.0 flashes per second, with some reduction in slope of the function from 2.0 to 4.0 flashes per second; (3) increase in illumination frequency from 2.0 to 4.0 flashes per second, and from 4.0 flashes to steady illumination, produced a highly significant reduction in tracking error scores. The findings that in tracking a continuous course, an operator's corrective movements can benefit from successive stimuli, received at a rate faster than two per second, contradicts the hypotheses which maintain that corrective responses are essentially a ballistic movement with a periodicity of two per second, and favors hypotheses which conceive of such responses as an integration of closely succeeding stimuli. (Authors' summary, modified)

4446
Katz, M. S.,
and S. D. S. Spragg
THE EFFECT OF INTERMITTENT COURSE ILLUMINATION OF DIFFERING FREQUENCIES ON TRACKING PERFORMANCE. — Univ. of Rochester, New York (Contract N6onr-241, Task Order 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York (SPECDEVCEN Project no. 20-M-1d). Technical Report no. SPECDEVCEN 241-6-16, Aug. 1, 1955. 8 p. AD 109 238 UNCLASSIFIED

Same as the preceding item, no. 4445.

4447
Kaufmann, W.,
R. Thauer, and G. Zöllner
[IMPERCEPTIBLE WEIGHT LOSS AS A FUNCTION OF ENVIRONMENTAL CONDITIONS: DEPENDENCE OF THE WATER VAPOR PRESSURE ON THE SKIN SURFACE AND OF THE WATER PENETRATION THROUGH THE SKIN ON THE TEMPERATURE AND WATER VAPOR PRESSURE OF THE SURROUNDING AIR AT MODERATE TEMPERATURE] Der insensible Gewichtsverlust als Funktion der Umweltbedingungen: Der Wasserdampfdruck der Hautoberfläche und die Wasserdurchgangszahl der Haut in Abhängigkeit von Temperatur und Wasserdampfdruck der umgebenden Luft im thermoindifferenten Bereich. — Pflügers Archiv für die gesamte Physiologie (Berlin), 216 (2): 189-198. 1955. In German.
DLC (QP1.A63, v. 261)

Water flow through the skin and the water vapor pressure at the skin surface were determined in three resting, unclothed subjects at moderate environmental temperature. Both values are functions of the difference between the saturated vapor pressure at skin temperature and the vapor pressure of the surrounding air. When the humidity of the air diminishes, the water flow through the skin decreases, resulting in a decrease of the vapor pressure difference between skin and air and therefore a relative decline of the water and heat losses through the skin.

4448
Kayser, C.
[HIBERNATION AND HYPOTHERMIA OF THE MAMMALS] Hibernation et hypothermie des mammifères. — Acta neurovegetativa (Wien), 11 (1-4): 38-59. 1955. In French, with English summary (p. 56-57).
DNLM

Similarties and differences in the thermoregulation of hibernating and nonhibernating homoiothermic animals are reviewed for the fall, winter, spring, and summer seasons; in response to cold stimuli; and during experimental hypothermia.

4449
Kayser, C.
[REACTIONS OF THE HOMEOTHERM TO A COLD STIMULUS] Réactions di l'homéotherme au stimulus froid. — Archives des sciences physiologiques (Paris), 9 (4): C5-C20; discussion, p. C20-C21. 1955. In French. DNLM

A review is presented of significant experimental observations of the phenomena of thermoregulation, including (1) the effects of environmental temperature on the motor activity and hormone secretion of insects and on the oxygen consumption, endocrine activity, and nerve conduction of poikilotherms and homeotherms; (2) the role of body weight, vascular regulation, muscle tone, muscle activity, shivering, tissue respiration, and nutrition in the thermoregulation of homeotherms; and (3) apparent death, critical temperature, and metabolic alterations in hypothermia. (84 references)

4450
Keist, B. F.,
W. F. Sheeley, J. M. Byers, and H. I. Chinn
RELATIVE EFFECTS OF HEAD IMMOBILIZATION AND MEDICATION ON THE INCIDENCE OF AIR-SICKNESS. — School of Aviation Medicine, Randolph Field, Tex. Oct. 1955. 3 p. Report no. 55-78. AD 90 665 UNCLASSIFIED

Paratroopers on simulated combat jumps were randomly distributed aboard C-119 aircraft and divided evenly into four groups receiving, respectively: (1) 0.65 mg. of hyoscine hydrobromide together with head support; (2) 0.65 mg. of hyoscine hydrobromide but no head support; (3) placebo plus head support; and (4) placebo without head support. Hyoscine afforded striking protection against airsickness whether or not it was supplemented with head support. Head support on the other hand, gave no protection. (Authors' summary and conclusions)

4451
Kellum, W. E.
THE BEGINNINGS OF AVIATION MEDICINE. — In: Bureau of Medicine and Surgery, Aviation medicine practice, p. 1-5. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955.
DLC (RC1062.U52)

A discussion is presented on the evolution of a medical service for military aviation from the period prior to World War I though World War II. The creation of a position of flight surgeon is reported and it is indicated that his work was early concerned with both selection of candidates for flight training and care of the flyer. Progress is noted with the organization of military and civilian laroratories for medical research in aviation and related fields as well as by the establishment of graduate and undergraduate courses in aviation medicine by medical schools.

4452
Kemp, A. H.
DISCUSSION OF SEAT EJECTION. — Air Defense Command Surgeon's Bulletin, 2 (1): 18-22. Feb. 1955. DNLM

Pilot errors in ejection procedure observed during a ground training program in the use of the F-84 type ejection seat are discussed. The program was initiated after two ejection accidents were attributed to improper fastening of equipment components and to faulty positioning procedure.

4453
Kerrick, J. S.
SOME CORRELATES OF THE TAYLOR MANIFEST ANXIETY SCALE. — Jour. Abnormal and Social Psychol., 50 (1): 75-77. Jan. 1955.
DLC (RC321.J7, v. 50)

The Taylor Scale of Manifest Anxiety, the Winne Scale of Neuroticism, and the L and K subscales of the Minnesota Multiphasic Personality Inventory were administered to 128 Air Force trainees. Further they were given the Armed Forces Qualification Test, Arithmetic Reasoning, Word Knowledge, and Mechanical Aptitude tests, and tested on comprehension of printed material. Manifest anxiety scores were found to correlate negatively with the above measures of general ability and intelligence. Exploration of the interrelationship between intelligence and anxiety scores led to the conclusion that it may be impossible to select subjects at extremes of the Taylor Scale who are equated in intelligence. Significant correlations were obtained between the Taylor Scale and the Winne Scale (.69) and Taylor Scale and K subscale of the MMPI (-.73).

4454
Kerslake, D. M.
FACTORS CONCERNED IN THE REGULATION OF SWEAT PRODUCTION IN MAN. — Jour. Physiol. (London), 127 (2): 280-296. Feb. 28, 1955.
DLC (QP1.J75, v. 127)

Skin temperature and sweat loss were measured in subjects during mild exercise in warm environments of low, moderate, or high humidity for periods of 1½ hours. Heat loss or gain was calculated from differences in skin and air temperature and from estimates of sweat evaporation. Formulas derived to fit results obtained from the experiment showed individual variation, but in all cases accorded with the hypothesis that sweat rate may be deduced under varying conditions from skin temperature and heat flow through the skin. It is suggested that sweat production may be controlled by the temperature of nerve endings at the level of the superficial arterial plexus of the dermis.

4455
Kerslake, D. M.
THE RATE OF DIFFUSIONAL WATER LOSS THROUGH HUMAN SKIN [Abstract]. — Jour. Physiol. (London), 127 (1): 18P-19P. Jan. 28, 1955. DLC (QP1.J75, v.127)

Weight change due to water diffusion through the skin was measured in a subject exposed to temperatures of 24-29° C. with air movement of 50 ft./min. With only constantly sweating areas covered to prevent the measuring of sweat loss, weight loss was found to be a linear function of the difference between the water-vapor pressure of the air and the saturated water-vapor pressure at skin temperature.

4456
Kettner, N. W.,
J. P. Guilford, and P. R. Christensen
A FACTOR-ANALYTIC STUDY ACROSS THE DOMAINS OF REASONING, CREATIVITY, AND EVALUATION [Abstract]. — Amer. Psychologist, 10 (8): 454. Aug. 1955. DLC (BF1.A55, v. 10)

Three overlapping batteries (a total of 62 tests) were constructed to test hypotheses regarding 12 factors in the areas of reasoning, creative thinking, and evaluation. Each battery was administered to approximately 200 air cadets. Three factor analyses were undertaken using Thurstone's centroid method of extraction and Zimmerman's orthogonal method of rotation. Twenty-one distinct factors were identified. Nine of the 11 factors were found in substantially the same form as before with some clarification of their nature. One factor, symbol manipulation, appears to have split into factors. The remaining factor, facility with verbal relations, did not reappear. Two new factors were found in the verbal area—concept formation and verbalizing ability. Three other factors were found whose tests were scattered among hypotheses under several different factors. They are tentatively called penetration, perceptual classification, and eduction of structural relations. The remaining five factors were reference factors.

4457
Killion, P. J.,
and K. E. Schaefer
TISSUE OXYGEN CONSUMPTION AND SLEEPING TIME DURING PROLONGED EXPOSURE TO LOW CONCENTRATIONS OF CARBON DIOXIDE. — Amer. Jour. Physiol., 183 (1): 44-45. Oct. 1955.
DLC (QP1.A5, v. 183)

Oxygen consumption of liver tissue slices of guinea pigs and rats exposed up to 41 days of 1.5% CO_2 was not significantly changed compared with control values. However, there was a trend to decrease between the 15th-41st day of exposure to CO_2. Values returned to initial levels during the 16-day recovery period on air following exposure to CO_2. The duration of the narcotic action of barbiturate was not significantly changed in guinea pigs after a 20-day exposure to 1.5% CO_2. (Authors' summary)

4458
Kilpatrick, F. P.
[VISUAL PERCEPTION]. — Princeton University, N. J. (Contract N6onr-27014). Final Report, May 1, 1955. iii+57 p. AD 65 492 PB 124085

Research in visual perception is reviewed and a transactional perceptual theory is developed. It conceives perception as a process which is primarily a learned activity of the organism. Perceptual organization of any moment is not related in an absolute fashion to the stimulus object, but is a probabilistic function of the past experience of the perceiver. The experiments are organized under the following headings: (1) apparatus development, (2) perception and language, (3) selective perceptual distortion, (4) research at Naval Medical Research Institute, (5) developmental studies of perception, (6) perceptual learning, (7) meaningful content in the study of binocular rivalry and fusion, (8) suggestions for further experimentation.

4459
Kilrain, W. A.
INSTRUMENTATION SIMPLIFIED. — Amer. Aviation 18 (16): 46-47. Jan. 3, 1955.
DLC (TL501.A675, v. 18)

An instrument panel developed through the Interim Instrumentation Program of the Navy's Bureau of Aeronautics incorporates design features intended to simplify information presentation by instrument combination, wide use of symbols and pictures, and use of vertical gauges.

4460
Kimball, F. N.
PASSENGER COMFORTS ON THE HIGH SEAS WITH SPECIAL REFERENCE TO THE CLINICAL EVALUATION OF ANTI-MOTION SICKNESS DRUGS. — Internat. Record Med., 168 (2): 72-77. Feb. 1955.
DLC (R11.M745, v. 168)

A clinical evaluation was made of the motion sickness drugs, Dimenhydrinate, Cyclizine and Meclizine. Cyclizine was found to be the most effective in the prevention and treatment of motion sickness without producing objectionable side effects.

4461
King, C. M.
A COMPARISON OF TWO ESCAPE SYSTEMS FOR THE B-66 AND RB-66 AIRPLANES. — Pitman-Dunn Labs., Frankford Arsenal, Philadelphia, Pa. Memorandum Report no. MR-587, April 1955. [23] p. (Project no. TS1-15-C104). AD 64 408
UNCLASSIFIED

The gas-initiated and electrically initiated escape systems for B-66 and RB-66 airplanes have been compared on all foreseeable counts, and the electrically initiated system has been found to have an over-all superiority. Its disadvantages of periodic handling requirements, radiation hazards, and sensitivity to temperature cycling are more than offset by its advantages of greater simplicity, lower combat vulnerability, lesser probability of failure, lower weight, and smaller space requirements. (Author's summary, modified)

4462
King, C. T. G.,
E. E. Williams, J. L. Mego, and K. E. Schaefer
ADRENAL FUNCTION DURING PROLONGED EXPOSURE TO LOW CONCENTRATION OF CARBON DIOXIDE. — Amer. Jour. Physiol., 183 (1): 46-52. Oct. 1955. DLC (QP1.A5, v. 183)

The adrenal-pituitary interrelationship was investigated in normal and hypophysectomized rats and normal guinea pigs during exposure to 1.5% CO_2 for from 11-15 or 28-42 days and during a 1.10 day period recovery in air. In normal and hypophysectomized rats, adrenal cortical activity was found to be increased during both periods of exposure and during recovery. The increase was indicated by a decrease of adrenal cholesterol and a significant eosinopenia and lymphopenia. Adrenal ascorbic acid content was reduced in normal rats during exposure to CO_2, but returned to the initial level during recovery. In guinea pigs, adrenal cortical activity was found to be increased only during the 28-42 day period of exposure to 1.5% CO_2, as shown by a significant eosinopenia and lymphopenia as well as a decrease of the adrenal cholesterol content. In both rats and guinea pigs, blood sugar remained at a normal level, apparently at the expense of liver and muscle glycogen stores. Liver glycogen returned to pre-exposure levels during the recovery period, while muscle glycogen remained at a lower level. (Authors' summary, modified)

4463
King, S. H.,
and A. F. Henry
AGGRESSION AND CARDIOVASCULAR REACTIONS RELATED TO PARENTAL CONTROL OVER BEHAVIOR. — Jour. Abnormal and Social Psychol., 50 (2): 206-210. March 1955.
DLC (RC321.J7, v. 50)

The type of cardiovascular reaction the subjects experienced during experimentally induced stress in a previously reported study [item no. 2770] was related to questions about childhood discipline and control by parents. The subjects describing their fathers as strict and dominant disciplinarians experienced a norepinephrine-like cardiovascular reaction during experimentally induced stress whereas subjects describing their fathers as mild and nondominant disciplinarians experienced epinephrine-like reaction. (Authors' summary, modified)

4464
Kingma, H.,
and C. D. de Langen
THE BLOODPRESSURE DIAGRAM IN THE LOW PRESSURE CHAMBER AT VARIOUS SIMULATED ALTITUDES. — Aeromedica acta (Soesterberg, Netherlands), 4: 105-110. 1955. In English DNLM

A blood-pressure diagram is obtained by registering a subject's blood pressure before exercise, after he has performed 20 deep knee bends within 25 sec., and every minute for 10 minutes while he remains standing. If the subject collapses during the last stage, the blood pressure is registered directly after the collapse while he is in a horizontal position. At low atmospheric pressure in a low-pressure chamber the collapse is evoked more readily. People with normal blood-pressure dia-

grams at sea level vary greatly in the extent of circulatory disturbances in response to this test at simulated altitudes. Blood-pressure diagrams of three subjects at sea level and at altitude are analyzed.

4465
Kingma, H.,
and C. D. de Langen
[HYPOXIA AND BLOOD CLOTTING] Hypoxie en bloedstolling. — Aeromedica acta (Soesterberg, Netherlands), 4: 98-104. 1955. In Dutch with English summary (p. 104). DNLM

Prothrombin time, coagulation time, and thrombocyte count were investigated in rabbits at two simulated altitudes (6000 m., 7000 m.) after 24 hours and 4 days. Both the prothrombin time and coagulation time were decreased in all rabbits after 24 hours at 7000 m. altitude; the thrombocyte count and blood lipid content were increased. These changes became more pronounced after 4 days in the low pressure chamber. At 6000 m. this effect was observed only in some of the experimental animals. Normal levels were regained a considerable time after the return to sea level. The thrombocyte count was first to return to normal. The critical point for the appearance of the hypoxic effect was found to lie close to 7000 m. altitude. Elevation of serum lipid content was observed also in rabbits under barbiturate sedation and with secondary anemia due to hemorrhaging. It is probable that serum lipids are involved in the coagulation process and blood platelet formation.

4466
Kingsley, D. W.
PRIVATE FLYING—CAN ITS ACCIDENT RATE BE REDUCED? — Jour. Aviation Med., 26 (1): 65-69. Fen. 1955. DLC (RC1050.A36, v. 26)

The author discusses some of the factors which relate to the high accident rate of privately owned and operated aircraft. The scheduled airlines flew approximately 2,220,000 hours during each of the years, 1951 and 1952; in 1951 alone, private pilots flew 8,613,000 hours. Within this span of time, there were 3,824 accidents involving private aircraft, which resulted in a fatality rate of 0.51 per 10,000 hours; scheduled airlines had a fatality rate of 0.02 per 10,000 hours for the same time span. The author feels that the infrequent inspection of private aircraft contributes to the accident rate; he blames also poor instrumentation, and the inadequate training given to most private pilots. Eighty percent of the accidents were directly attributable to pilot error. Most of the pilots involved were under forty years of age, and had less than 300 hours of flying experience. The highest mortality rate occurred during weather which required instrument flying. To improve the situation, the author suggests improved safety devices for the plane, more thorough training, and better education concerning air accidents and their causes.

4467
Kinsey, J. L.,
and H. B. Murphree
CLAUSTROPHOBIC REACTIONS TO SOME STRESSES OF THE SUBMARINE SERVICE. — Naval Medical Research Lab., New London, Conn. MRL Report no. 262 (vol. 14, no. 2), April 4, 1955. 39 p. (Project NM 003 041.53.03). AD 72 945 PB 124556

Seventeen seamen who exhibited marked phobic reactions during training or in service on submarines were examined to detect a common pattern of previous experiences or displayed similarity in symptomatology and dynamics. The clinical evaluation in most cases consisted of a psychiatric interview and Rorschach test. While the individuals comprising the sample were similar in many respects and had been subjected to the same stresses, the findings disclosed marked variation in severity of symptoms, time and nature of onset as well as the specificity of the fear displayed. Analysis of the data indicates that neither simple screening methods nor Rorschach testing is effective in detecting individuals with subclinical claustrophobic tendencies prior to exposure to the stressful situation. There is some indication that claustrophobia is more likely to appear in individuals who utilize hysteric character defenses.

4468
Kleeman, C. R.,
D. E. Bass, and M. Quinn
EFFECT OF 6063, SODIUM BICARBONATE AND AMMONIUM CHLORIDE ON ELECTROLYTE COMPOSITION OF THERMAL SWEAT. — Proc. Soc. Exper. Biol. and Med., 88 (2): 253-256. Feb. 1955. DLC (QP1.S8, v. 88)

Thermal sweat collected by arm bags from male subjects exposed for weekly periods of 1 to 1 1/2 hours to a temperature of 120° F. was found to be a moderately acid secretion, low in ammonia and titratable acid. Administration of a carbonic anhydrase inhibitor (6063), sodium bicarbonate, or ammonium chloride did not alter the acid-base composition of sweat regardless of changes in composition of extracellular fluids and urine. It is concluded that sweat glands have no regulatory role in the maintenance of the hydrogen-ion concentration of body fluids.

4469
Kleinerman, J.,
and A. L. Hopkins
EFFECTS OF HYPOTHERMIA ON CEREBRAL BLOOD FLOW AND METABOLISM IN DOGS [Abstract]. — Federation Proceedings, 14 (1I): 410. March 1955. DLC (QH301.F37, v. 14)

Hypothermia induced in dogs by immersion produced decreases in blood pressure, pulse, respiration, cerebral blood flow, and cerebral oxygen consumption, and increases in cerebrovascular resistance and the cerebral arterio-venous oxygen and carbon dioxide differences. The decrease in cerebral blood flow during hypothermia was independent of pCO_2 and pH changes and was attributed to the local increase in cerebrovascular resistance which were apparently independent of pCO_2 and pH.

4470
Klemmer, E. T.
RATE OF FORCE APPLICATION IN A SIMPLE REACTION TIME TEST. — Operational Applications Lab., Air Force Cambridge Research Center, Washington, D. C. Report no. AFCRC-TR-55-1, June 1955. iii+7 p. AD 68 162 PB 118431

An electrical strain gage was fitted to a pressure key and continuous force records were taken during a simple reaction time experiment. Various levels of holding force previous to stimulus onset were

required of the subject with two widely different amounts of additional force for the response. It was found that pre-stimulus holding forces up to 20 ounces had little effect on either the slope or temporal position of the rate of force application curves. Thus, pre-stimulus holding force had little effect upon reaction time defined by a given additional force. However, the slope of the force vs time curves is such that reaction time differences of 0.04 sec. may be obtained by changing the added force required of the response from 1 to 20 ounces. (Author's abstract)

4471
Kline, R. F.,
and H. C. Dyme
EFFECT OF TEMPERATURE ON THE RELATION OF FOOD TO SURVIVAL POTENTIAL OF ISOCALORICALLY RESTRICTED ANIMALS. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-66, Feb. 1955. iii+11 p. AD 63 617
PB 134392

Rats restricted quantitatively to eight calories per day and qualitatively to single constituents, positive controls on a balanced regimen restricted to the same fuel level, negative controls (starving), and normal controls (balanced regimen-unrestricted) were maintained at 90° F., 78° F., and 38° F. Food was borne out to be an important facet in the survival stress-strain complex. Eight calories per day doubled the survival time at 78° F., tripled the survival time at 90° F., but provided no survival advantage at 38° F. In the absence of food, length of survival also varied with temperature; cold stress decreased the survival potential of starving animals, markedly. The relative water intake of calorically restricted animals further demonstrated that carbohydrates would be advantageous while protein would be disadvantageous for survival feeding in severely limited water situations. (From the authors' abstract)

4472
Klosovskiĭ, B. N.
and E. N. Komarrskaĭa
[ANIMAL BEHAVIOR FOLLOWING TOTAL ELIMINATION OF VISUAL, AUDITORY, OLFACTORY, AND VESTIBULAR RECEPTORS AT AN EARLY AGE] Povedenie zhivotnykh posle polnogo zritel'nogo, slukhovogo, obonîatel'nogo i vestibuliarnogo retseptorov v rannem vozvraste. — Biûlleten' eksperimental'noĭ biologii i meditsiny (Moskva), 40 (9): 3-10. Sept. 1955. In Russian. DLC (R91.B56, v. 40)

Sensory receptors were surgically removed from puppies at the age when the structural maturity of the brain was in the process of development and contact with external environment was being established. Records were kept of the means and mechanisms utilized by the operated animals in their effort to acquire cognizance of and orientation in the external environment. Following the complete removal of the visual, hearing, olfactory and vestibular receptors at an early age, the puppies developed a compensating orientation mechanism with the aid of the skin and musculo-articular receptors.

4473
Knight, J. S.
CUSHION MOUNTING FOR MASS IMPEDANCE RESONANCE FILTER. U.S. Patent 2,717,596. Sept. 13, 1955. 2 leaves. DP

A modified personal ear protector is described and illustrated composed of a tubular casing of resilient material. It may prevent damage to the inner ear and contiguous brain sections due to blast, shock waves, or excessive sound levels.

4474
Knoepfel, H. K.
[FRENCH EXPERIENCES CONCERNING DISCIPLINARY OFFENSES IN THE AIR] Französische Erfahrungen über Disziplinlosigkeiten in der Luft. — Flugwehr und -Technik (Frauenfeld), 17 (11): 264-265. Nov. 1955. In German.
DLC (TL503.F625, v. 17)

Approximately 10% of the flight accidents due to pilot error in the French Air Force are surmised to be caused by transgressions against the rules. A considerable proportion of these could have been avoided by more stringent psychiatric selection to exclude unstable personalities with past history of disciplinary offenses. The author maintains that the Swiss psychiatric selection of pilots has been successful in reducing disciplinary offenses without excluding too much of good pilot material.

4475
Knowles, W. B.,
and E. P. Newlin
CODING BY GROUPS AS A MODE OF STIMULUS PRESENTATION. — Naval Research Lab., Washington, D. C. NRL Report no. 4604, Sept. 1, 1955. i+10 p. (Project no. NR 592-030). AD 74 002
PB 119144

Using a 5x5 matrix of lights and a similar panel of pushbuttons, five subjects were required to respond to sequences of 60 signals presented in subsequences of two, three, or four signals with intervals of 0.37, 0.52, 0.68, or 1.02 seconds between signals. Performance on each of these 12 experimental conditions was compared with a signal-by-signal control condition in terms of speed and accuracy measures. It was found that under limited conditions coding by groups can result in better performance than the item-by-item mode of operation, and that the amount of information rather than the rate at which it is presented seems more critical in determining the temporal organization of the responses to grouped signals. (Authors' abstract)

4476
Konecci, E. B.,
W. F. Taylor, and S. S. Wilks
BIOLOGICAL AND MEDICAL EFFECTS OF IONIZING RADIATION: PROTECTIVE ACTION OF CARBON MONOXIDE IN MAMMALIAN WHOLE-BODY X-IRRADIATION. — School of Aviation Medicine, Randolph Field, Tex. Report no. 65-8, March 1955. 8 p. AD 64 788 PB 118056

The present study was designed to test the possible prophylactic and therapeutic usefulness of carbon monoxide in mammalian whole-body X-irradiation. Guinea pigs, rats, and rabbits were utilized in a variety of treatments. CO was administered either by inhalation (0.10% CO) or intraperitoneal injection (100% CO). Whole-body X-irradiation was performed with a Picker X-ray unit (260 KVP, 18 ma.), and all of the statistically treated animals were exposed to lethal doses of X-rays. Protection occurred in pre- and/or post-irradiated, CO-treated animals to different degrees. Protection depends on (1)

optimal amounts of CO inhaled or injected, (2) critical times of CO administration, and (3) dose of whole-body X-irradiation. Possible modes of prorection afforded by CO are discussed.

4477
Konecci, E. B.
TOLERANCE TO SIMULATED ALTITUDE AFTER WHOLEBODY X-IRRADIATION IN GUINEA PIGS. — Jour. Aviation Med., 26 (2): 130-136. April 1955. DLC (RC1050.A36, v. 26)

Determinations were made of the tolerance of 360 guinea pigs to simulated altitude after whole-body X-irradiation. Of this group, 190 were used to obtain the normal hypoxia tolerance curve; 100 were used for preliminary radiation studies, and 70 were used in the statistically evaluated experiments. Animals were exposed to various simulated altitudes in a decompression chamber after being irradiated in a small plastic chamber at ground level. The equilibrium method was adopted as the standard test for consciousness. Upon reaching the desired altitude each animal was placed upon its back, once each minute; as long as the guinea pig flipped to an upright position, it was conscious; when, however, 3 negative responses were obtained (the animal remaining in a supine position) it was considered unconscious. The 500-r. group tested 1 hour after irradiation displayed no decrease in altitude tolerance; however, the second 500-r. group tested 24 hours after irradiation; the 1,600-r. and 4,000-r. groups tested 1 hour and 24 hours after irradiation, showed statistically significant decreases in tolerance to altitude or hypoxia.

4478
Konjiki, S.,
and M. Ohmura
PSYCHIATRIC AND PSYCHOLOGICAL CONSIDERATION ON FAILED DEFENSE ACADEMY CADETS. — Japanese Safety Forces Med. Jour. (Tokyo), 2 (2): 12-14. Feb. 1955. In Japanese, with English abstract (p. 3-4). DNLM

The causes of failure of cadets at the Defense Academy are classified as (1) long-term absence, (2) poor scholarship, (3) failure to demonstrate loyalty to the country, and (4) suicide. An attempt was made by psychiatric interviews and the emotional inventory to correlate failure with an obvious deviation from the emotional average. Only 11% of the failed cadets showed normal emotional stability; 65% demonstrated obvious derangement, and 24% showed low stability. Cadets in group (1), who were absent chiefly because of pulmonary tuberculosis, lacked emotional stability, as did 83% of the cadets in group (2) and 75% in group (3). Group (4) cadets constantly suffered somatic symptoms such as abdominal pain and lack of appetite.

4479
Kooker, J. K.,
and A. A. Taylor
COMPACT BOX LUNCH TRIAL AT MACDILL AIR FORCE BASE, FLORIDA. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-114, May 1955. vi+38 p. (Project no. 7156). AD 76 874 UNCLASSIFIED

The suitability of a compact box lunch developed for use in jet aircraft on long range flights was determined in a field trial. Special foods and packaging were used to provide a flight meal conforming to the critical time, space, and operational limitations peculiar to B-47 type aircraft. The method used for wrapping and packaging in portions approximately bite-size was found to be satisfactory. Meals consisting of sandwiches, dried fruits, nuts, candy, relishes, eggs, crackers, and fruit juices were judged to be acceptable for five-hour flights, but required the addition of more substantial food items for twenty-four hour flights. (Quoted in part)

4480
Kostelijk, P. J.
[THE ORGANIZATION OF THE BATTLE AGAINST DEAFNESS CAUSED BY ACOUSTIC TRAUMA IN GROUND PERSONNEL] L'organisation de la lutte contre la surdité causée par traumatisme acoustique chez le personnel au sol. — Médicine aéronautique (Paris), 10 (1): 59-61. 1955. In French. DLC (TL555.M394, v. 10)

Measures taken in Holland to meet the problem of noise-induced deafness among aviation ground personnel are briefly described. In 1952, audiometric examinations conducted at all air bases revealed the presence of deafness of 20 db. at at least one frequency among 10% of the personnel. Protective measures, including transfer of partially deaf personnel, regular audiometric examination, the use of ear protectors, and education of personnel have been instituted.

4481
Kroeker, E. J.,
and E. H. Wood
COMPARISON OF SIMULTANEOUSLY RECORDED CENTRAL AND PERIPHERAL ARTERIAL PRESSURE PULSES DURING REST, EXERCISE AND TILTED POSITION IN MAN. — Circulation Research, 3 (6): 623-632. Nov. 1955. DLC (RC681.A1A57137, v. 3)

Central (aortic or subclavian), brachial, radial, and femoral pressure pulses were recorded simultaneously in 12 healthy subjects during conditions of rest, exercise and 70 degree head-up tilt. Peripheral systolic pressure at rest uniformly exceeded the central systolic pressure generated by the same heartbeat. The average radial pulse pressure was 146, 146, and 165% of central pulse pressure during rest, exercise, and tilt, respectvely, while radial mean pressures were 94, 93 and 98% of central mean pressures, respectively. Summation of the incident pulse wave with reflected waves from the periphery and resonance effects in the peripheral arterial systems may produce these changes in pressure and contour. (Authors' abstract)

4482
Krog, H.,
M. Monson, and L. Irving
INFLUENCE OF COLD UPON THE METABOLISM AND BODY TEMPERATURE OF WILD RATS, ALBINO RATS AND ALBINO RATS CONDITIONED TO COLD. — Jour. Applied Physiol., 7 (4): 349-354. Jan. 1955. DLC (QP1.J72, v. 7)

White rats maintained for six weeks at 30° or 5° C., and wild rats accustomed to temperatures from 0° to -30° C. were exposed for 2 1/2 hours to

temperatures of 30° to -60° C. The basal metabolic rate at 30° C. was 60% higher in white rats conditioned to cold than in 30°-conditioned animals, and was 20% higher in wild rats. The metabolism of warm control and cold-conditioned white rats was raised 3 times the basal rate during exposure to cold as low as -10° and -30° C., respectively, but declined at temperatures below these points. The metabolic rate of wild rats was raised 6 times or more and did not decline until a temperature of -40° C. was reached. Body temperature was found to correspond to metabolic rate, but began to decline at a higher temperature than did the metabolic rate.

4483
Kryter, K. D.
SPEECH COMMUNICATION IN NOISE. — Air Force Cambridge Research Center, Operational Applications Lab., Bolling Air Force Base, Washington, D. C. Report no. AFCRC-TR-54-52, May 1955. vi+41 p. AD 68 618 PB 118446

A comprehensive review is presented of experimental data concerning the acoustical characteristics of speech (speech spectra, distributions of speech energy, average power of speech, amplitude-intensity time analysis), methods of measurement of speech intelligibility, the effects of some acoustical factors (masking noise, frequency or amplitude distortion, reverberation, interaural phase relations) upon speech intelligibility, the prediction of these effects, and practical limitations on speech communication in noise. A noise level of 85 decibels re threshold (after ear-plug attenuation) is suggested as the maximum level at which speech communication may be maintained without hearing damage. Optimal systems for speech presentation in intense noise are outlined.

4484
Kubala, A. L.
THE INTERPRETATION AND PREDICTIVE VALIDITY OF TRAINING-LEVEL CRITERIA FOR THE PERFORMANCE OF AIR FORCE FLYING DUTIES [Abstract]. —— Amer. Psychologist, 10 (8): 455. Aug. 1955. DLC (BF1.A55, v. 10)

This study was performed with 666 Air Force Cadets who completed pilot training at Randolph Air Force Base. A group of 24 ratings was factor analyzed and six factors were found. A second analysis including factor estimates from the first analysis, peer and superior ratings, and objective data was accomplished. Seven criterion dimensions were found. Factor-score estimates for each of these factors, scores from training level predictor tests, additional ratings by psychologists, and a post-training criterion based on the personnel record were intercorrelated. Variables from different sources, loaded on the same factors, demonstrated communality between the measures. Three of the seven factors, all three of the additional psychologist ratings, and two of the four predictor measures correlated significantly with the follow-up criterion. This indicates that the same factors are significant in successful adjustment to flying in both the training and post-training situation. Also, the loss in predictive efficiency through time was relatively small.

4485
Kubicek, W. G.
A STUDY OF THE EFFECTS OF HYPOXIA UPON THE COURSE OF FEVER IN DOGS AND MONKEYS. —— Univ. of Minnesota Medical School, Minneapolis; issued by School of Aviation Medicine, Randolph Field, Tex. Report no. 55-10, May 1955. AD 80 074 UNCLASSIFIED

Experiments upon dogs and monkeys revealed that hypoxia may aggravate fever, especially during circulatory dysfunction. Reduced blood sugar and elevated plasma creatinine indicated the possibility of serious metabolic impairment during hyperpyrexia. Reduced blood carbon dioxide content with a small rise in pH was a usual finding. Blood oxygen content increased with increases in hematocrit. Histological studies showed tissue damage in the visceral organs by fever and hypoxia. Microscopic brain tissue studies on formalin-perfused animals failed to show conclusive histological changes in spite of severe neurological disturbances during the course of some of the experiments. The rapidity of the body temperature response to the onset of hypoxia may be of importance in flying at supersonic speeds and reaching altitude very rapidly. Under these conditions the crew could be subjected to a sudden rise in environmental temperature and simultaneously a rapid decline in oxygen tension in the inspired gases.

4486
Kuhn, L. A.
ELECTROCARDIOGRAPHIC STUDIES OF NORMAL MEN HOUSED AT DIFFERENT SHELTER TEMPERATURES AFTER VARIOUS GRADES OF WORK IN ARCTIC AND TEMPERATE CLIMATES. —— Army Medical Research Lab., Fort Knox, Ky. Report no. 160, Jan. 21, 1955. ii+[33] p. (Project nos. 6-64-12-028 and 6-61-004). AD 55 372 UNCLASSIFIED

The effects of arctic climate and different field shelter temperatures on the electrocardiograms of seven normal men performing various grades of work outdoors in arctic and temperate climates were investigated. Significant changes occurred with greater frequency and severity in outdoor post-exercise electrocardiograms in the arctic than in the temperate climate. More frequent and more post-exercise electrocardiographic changes were noted when the men lived in a 50° F. shelter than when they were housed at 70° F. Depression of the RS-T segments, premature ventricular contractions and disappearance of the R-wave in lead V_4 were the principal alterations observed. It is suggested that the dual stresses of exercise plus cold exercise affect the electrocardiogram to a greater extent than does exercise alone. (Author's abstract)

4487
Ladell, W. S. S.
THE EFFECTS OF WATER AND SALT INTAKE UPON THE PERFORMANCE OF MEN WORKING IN HOT AND HUMID ENVIRONMENTS. —— Jour. Physiol. (London), 127 (1): 11-46. Jan. 28, 1955. DLC (QP1.J75, v. 127)

Acclimatized men were exposed to environmental temperatures of 93-100° F. for up to 4 hours under alternating work and rest conditions. Water loss, work performance, rectal temperature, pulse rate, and chloride loss were compared in subjects drinking no water or drinking 0.1, 0.2, or 0.5% saline during the experiment. The subjective

effect of differences in water and salt intake was found to be more marked than the objective effect, and was manifested by sensations of fatigue. In a physical exercise, 18 failures (unable to continue) were recorded in 20 subjects given either salt and no water or a great excess of salt; 9 failures in 12 subjects given neither water or salt; and 3 failures in 41 subjects given water with or without salt. Drinking water or not had no effect on sweat rate, and only little effect on rectal temperature and heart rate. The administration of salt produced a relative decrease in rectal temperature and heart rate, an increase in sweat chloride content, and an increase in sweat rate when intake was lower than the chloride content of sweat. The unfavorable effects of abstention from water and salt could be predicted from changes in intra-cellular fluid volume, and were perhaps also produced by alterations in adreno-cortical activity and renal function.

4488
Lager, C. G.
[ACCIDENT-PRONENESS TENDENCIES AMONG FLYING PERSONNEL] Tendenser till vaneskada hos flygande personal. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (4): 22-26. 1955. In Swedish. DNLM

A statistical analysis of 2,000 flight accidents (reduced to 1,000 by elimination) in the Swedish Air Force shows that about 4% of the personnel account for 25% of the accidents. Explanation is sought in the psychical stress pilots with one or two accidents are exposed to. Thorough examination of this minority group (together with a control group) is advocated to establish their differential psychical characteristics. Once established, these characteristics could be utilized in sifting out undesirable applicants.

4489
Laguna, J.,
J. Rodríguez, L. Gutiérrez Villegas, and E. Pardo
EFFECTS OF ANOXIA ON THE PERFUSED CAT LIVER. — Acta physiologica latinoamericana (Buenos Aires), 5 (3): 155-162. 1955. In English. DLC (QP1.A25, v. 5)

Certain functions of the liver were studied in cat livers perfused with blood containing either 0.5 or 4 volumes percent of oxygen. Bile production was found to be unaltered in anoxic livers, while the rates of fixation of bromosulfonphenolphthalein and transformation of fructose into glucose were slightly reduced. The capacity for glycogen synthesis was greatly decreased, suggesting the measurement of this function as a criterion in the evaluation of pharmacological agents acting on the processes of energy utilization.

4490
Lal, S.
SELECTION OF PERSONNEL. — Aero Med. Soc. Jour. (New Delhi), 2 (1): 8-9. April 1955. DNLM

A brief discussion is presented on the methods used by the Indian Air Force in the selection of officers and airmen. Officer candidates are given personality (formal interview, situational and projection tests) and aptitude tests; potential airmen are tested for intelligence and aptitude. Problems encountered in the selection procedure include: (1) language (candidates have poor knowledge of English and courses are taught in English), and (2) utilization and interpretation of pilot aptitude tests.

4491
Lalli, G.,
E. Sulli, and G. P. Ghinozzi
[MODIFICATIONS IN PLASMA AND ERTHROCYTE CHOLINESTERASES OF THE RAT CAUSED BY ACCLIMATIZATION TO HIGH ALTITUDE] Modifiche indotte dall'acclimatazione alle alte quote sulla colinoesterasi del plasma e degli eritrociti nel ratto. — Rivista di medicina aeronautica (Roma), 18 (2): 309-321. April-June 1955. In Italian, with English summary (p. 319). DLC (TL555.A1R5, v. 18)

Thirty rats exposed to a simulated altitude of 8,000 meters for 12 days, following 12 days of acclimatization to lower altitudes, exhibited a total decrease of cholinesterase activity in erythrocytes by 28.69%, and in plasma by 39.44%, as compared to control animals. No evident relationship was found between increase in the number of erythrocytes and reduction of cholinesterase in erythrocytes and plasma. This change cannot be attributed to possible variations of cholinesterase in young erythrocytes, the great number being formed under the action of the anoxic stimulus.

4492
Lamarche, M.
[EFFECT OF VARIOUS SYNTHETIC ANTIHISTAMINICS ON THE RESISTANCE OF THE GUINEA PIG TO OXYGEN DEFICIENCY] Action de divers antihistaminiques de synthèse sur la résistance du cobaye au déficit en oxygène. — Revue de pathologie générale et comparée (Paris), 55 (666): 390-399. March 1955. In French. DNLM

Anoxia was induced in nonanesthetized guinea pigs by decompressing them in a chamber at a rate of 1,000 meters per minute until a simulated altitude of 12,000 meters was reached. The administration of various antihistaminics (mepyramine, promethazine, antazoline, thiazinamine, etanautine) significantly reduced the resistance to anoxia. It was noted that this action had no direct relation to dosage.

4493
Langen, C. D. de,
and G. J. Puister
LONG P-R INTERVAL IN YOUNG MEN AND THE INFLUENCE OF MEALS. — Aeromedica acta (Soesterberg, Netherlands), 4: 111-114. 1955. In English. DNLM

P-R intervals longer than 0.24 second have been observed occasionally in electrocardiograms of healthy young men (pilot candidates) during routine medical examination prior to receiving a flying certificate. In three candidates they gave rise to Wenckebach periods. Frequently, however, physical exertion or a good meal reduced the P-R interval to normal. The influence of meals on the electrocardiogram was further investigated in 100 candidates between the ages of 18 to 21 years, 99 of whom showed a normal fasting P-R interval; one

had an extremely prolonged fasting P-R interval which, however, reverted to normal after a meal. Fifty-four of the normal candidates showed no change in duration of the P-R interval after a meal, four had an increase, and 41 had a decrease.

4494
Langen, C. D. de
THE MUSCLE TISSUE TENSION IN SYNCOPE. — Aeromedica acta (Soesterberg, Netherlands), 4: 22-26. 1955. In English.
Also published in: Folia psychiatrica neurologica et neurochirurgica neerlandica (Amsterdam), 58 (4): 254-258. Aug. 1955. In English. DNLM

Muscle tissue tension in syncope was investigated in three subjects. The syncope was provoked by two stress tests: (1) the subject performed rapidly 20 deep knee bends at the end of which he remained motionless in upright posture for 10-20 min.; and (2) the subject blew a column of mercury to 40 mm. and held it at that level as long as possible. Muscle tissue tension was registered in the calf and upper-arm muscles before and immediately after the subject had fainted, and 15 min., 1 hour, and 3 hours later. Muscle-tissue tension dropped sharply in accordance with the subjective feeling of muscular weakness prior to loss of consciousness. Fifteen minutes later the blood pressure had returned to normal, but the muscle tension was still considerably below the normal level. Later determinations showed that muscle tension rose very slowly. Other experiments indicate that tissue tension can change without a change in muscle blood volume; in fact, in emotional fainting there is an increase in forearm circulation while the muscle tension is diminished. The author discusses tissue tension in general, relating it to capillary and interstitial fluid dynamics.

4495
Langraf[-Favre], F.
[OTOLOGIC PROGRESS IN AVIATION] Actualités otologiques en aéronautique. — Médecine aéronautique (Paris), 10 (1): 21-23. 1955. In French.
DLC (TL555.M394, v. 10)

A brief review of the subject of the pathological effects of noise in aviation personnel, including a discussion of certain questions yet unsolved, is presented. Topics discussed are the treatment of barotraumatic lesions by irradiation with X-rays and radium, the examination of noise-induced deafness by spoken voice rather than audiometric tests, the use of Vitamin A and ear protectors in the prevention of deafness, and individual differences in susceptibility to deafness.

4496
Langraf-Favre, F.
[THE EFFECTS OF SOUND VIBRATIONS] Les effets de vibrations sonores. — Médecine aéronautique (Paris), 10 (4): 345-356. 1955. In French.
DLC (TL555.M394, v. 10)

The nature of aircraft noise, the physiology of the ear, the effects of vibrations on the ear and the whole organism, individual differences in vulnerability to deafness, and prevention of deafness are briefly discussed.

4497
Lansberg, M. P.
FOLLOW UP REPORT ON THE VESTIBULAR TESTS IN CANDIDATE PILOTS. — Aeromedica acta (Soesterberg, Netherlands), 4: 159-162. 1955. In English. DNLM

The predictive value of three vestibular tests, Trepaesthetic test, Modified Barany test, and Vestibular Adroitness test was assessed. These tests had been administered in the above sequence to a population of more than 500 pilot candidates on the fourth day of selection examinations after the decision in regard to acceptance or rejection had been made. Subsequently the population was classified into five categories on the basis of instructor's reports of success in training and the amount of motion sickness suffered. With one exception candidates with vestibular performance rated as bad or very bad were not successful in training. The trepaesthetic test had not proved to be a suitable predictor of pilot proficiency or air sickness. With some reservations the vestibular adroitness test appeared to have value in predicting failure in flight training.

4498
Lansberg, M. P.
[THE FUNCTION AND FUNCTIONING OF GROUP AUDIOMETRY] Functie en functioneren van de groepsaudiometer. — Aeromedica acta (Soesterberg, Netherlands), 4: 151-157. 1955. In Dutch, with English summary (p. 156). DNLM

The apparatus and procedures developed for group audiometry are described. Thirty-six tones at six frequencies between 875 c.p.s. and 3500 c.p.s. and six intensity levels ranging from 5 db. to 30 db. were chosen to delimit the speech range. Each tone is presented in a random order as either 1, 2, or 3 pulses. The subject records the number of pulses of each tone on a special form in the place indicated by a light signal. A standard scoring card is used to read the result. It is possible to detect developing or existing hearing loss by comparing the initial test results with successive recordings. Timely detection of incipient social hearing loss is emphasized for the prevention of legal liability.

4499
Lansberg, M. P.
THE FUNCTION OF THE VESTIBULAR SENSE ORGAN AND CONSTRUCTION OF A SATELLITE. — Aeromedica acta (Soesterberg, Netherlands), 4: 172-179. 1955. In English. DNLM

The principles of satellite design and the physiological effects of satellite flight are considered. It is feared, that under conditions of semi-weightlessness and the influence of angular velocity, conflicts within the vestibular sensations and with other senses may severely disorganize human function and behavior unless counterbalanced by central adaptation processes. Opinions are expressed on the physiological limitations of the value of angular velocity and gravity for normal functioning.

4500
Lansberg, M. P.
[THE HEARING REQUIREMENTS FOR FLIGHT PERSONNEL] Gehoor-eisen voor vliegend personeel

—— Nederlands militair geneeskundig tijdschrift (Gravenhage), 8 (3): 59-74. 1955. In Dutch.
DLC (RC971.N4, v. 8)

Same as item no. 3055, vol. III.

4501
Lansberg, M. P.
ON THE ORIGIN OF THE UNPLEASANT SENSATIONS ELICITED BY HEAD MOVEMENTS DURING AFTER-SENSATIONS. —— Aeromedica acta (Soesterberg, Netherlands), 4: 67-72. 1955. In English.
DNLM

Many configurations in flying and aerobatics involve angular accelerations which are prolonged or not cancelled immediately by decelerations. The unusual stimulus situation gives rise to misleading spatial information which, however, becomes disturbing and unpleasant only if the delusions are mutually conflicting or in conflict with perceived reality. A special case is the intralabyrinthine conflict created by conflicting sensations from the semicircular canals and the otoliths elicited by head movements during a period of primary after-sensation after prolonged rotation around the vertical axis. The steady g-acceleration is no longer perpendicular to the plane of subjective rotation, therefore the otolith sensations will contradict the sensation of rotation. More often in flying the resultant of linear accelerations takes the place of a simple g-acceleration. (From the author's summary)

4502
Lanzetta, J. T.,
and D. M. Knoell
A COMPARATIVE STUDY OF THE ATTITUDES OF STUDENT GROUPS IN ADVANCED FLYING TRAINING. —— Air Force Personnel and Training Research Center. Crew Research Lab., Randolph Air Force Base, Tex. Research Report no. AFPTRC-TN-55-30, Oct. 1955. vi+21 p. (Project no. 7731, Task no. 77427). AD 99 483 UNCLASSIFIED

A study was undertaken for assessing the effects of the Project Tiger training program on the attitudes and motivation levels of advanced flying trainees at 8 CTAF bases. The attitude-measuring instrument was a modification of an attitude survey developed earlier. Changes in attitudes were assessed by computing the differences between the scores at the beginning and end of training. Project Tiger did not produce uniformity in attitudes toward flying, combat, and AF life. The extent and direction of attitude changes during the training program and the mean attitude level of graduating students differed at the different bases, the differences being associated with differences in mission assignments. Selection and indoctrination emphasis apparently affect this association: jet-fighter students were more aggressive and had less anxiety over flying than jet-interceptor or bomber trainees. Attitudes of students were not highly associated with the norms for the instructor group as a whole; they were not related to the expressed attitudes of the instructors with whom they were paired. Neither base facilities nor satisfaction with specific aspects of the training program appeared to be important determinants of the students' attitudes. (From the AD abstract)

4503
Lanzetta, J. T.,
and D. M. Knoell
SOME CORRELATES OF INSTRUCTOR JOB SATISFACTION. —— Air Force Personnel and Training Research Center. Crew Research Lab., Randolph Air Force Base, Tex. Research Report no. AFPTRC-TN-55-28, Sept. 1955. vi+49 p. (Project no. 7731, Task no. 77427). AD 80 382 PB 122386

The relationship between "satisfaction with present job assignment", other attitudinal, demographic, and performance characteristics, and base differences was investigated by the administration of questionnaires in 765 instructors at eight Crew Training Air Force bases. Analysis of information obtained indicates that: (1) Instructors who express a sense of personal well-being in the Air Force and who rate the training program high are better satisfied with their job assignment. Sense of safety in flying and rating of base facilities are related to job satisfaction only at particular bases. (2) Specific factors related to job satisfaction include opportunities for advancement, friendships in the Air Force, feeling of importance of the assigned mission, interest in flying, and perception of high morale and proficiency in other instructors. (3) Instructors who are better satisfied with their job assignment tend to have lower rank and reserve status but do not differ in age. Those with higher Korean "kill" records tend to be more satisfied with their assignment. (4) Attitudinal measures of satisfaction with job assignment, personal well-being in the Air Force, safety in flying, necessity for a strong Air Force, adequacy of base facilities, and evaluation of the training program differ from base to base. (Quoted in part)

4504
Larkin, T. J.,
and C. H. B. McLendon
DESIGN REQUIREMENTS FOR AN AIR TRANSPORTABLE SURGICAL THEATER. —— Consultants and Designers, Inc., Rosslyn, Va. (Contract AF 33(616)-2732); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio (Project no. 6355). WADC Technical Report no. 55-168, April 1955. xvii+227 p. AD 80 296 PB 122460

The design of an emergency surgical facility which can be flown to disaster sites to provide initial definitive surgery for non-transportable wounded is described. A determination was made of the interior arrangements and medical supplies necessary for 24-hour continuous operation of a two-operating-table, self-contained surgical unit. To house this unit, a container was designed which weighs only 4000 pounds and which permits a payload of 8000 pounds. It has integral aircraft loading and mobility arrangements and a large, unencumbered floor and wall area. Air conditioning, heating, lighting, power, explosion proofing, and auxiliary shelter features are provided. Consideration was given to problems of center of gravity, transportation of hazardous and temperature-sensitive materials, cargo loading, removal of the surgical theater from the aircraft, and prime movers for the unit. The container which houses the emergency facility can also be used to form nuclei of airborne hospitals or for a variety of other purposes. (Authors' abstract, modified) (152 references)

4505
Latham, F.
A MAN-CARRYING CENTRIFUGE. — Nature (London), 175 (4468): 1057-1059. June 18, 1955. DLC (Q1.N2, v. 175)

Performance, operation, and design of the man-carrying centrifuge at the R.A.F. Institute of Aviation Medicine, Farnborough, are briefly described.

4506
Lawton, R. W.,
L. Greene, R. Crosbie, and L. Peterson
BLOOD PRESSURE CHANGES IN THE MONKEY DURING POSITIVE ACCELERATION [Abstract]. — Amer. Jour. Med. Sci., 230 (4): 467-468. Oct. 1955. DLC (R11.A5, v. 230)

Anesthetized monkeys exposed to sinusoidal positive accelerations of approximately 5 seconds duration exhibited blood pressure responses in the arterial system which are believed to arise from hydrostatic effects which are counteracted by a diminution in the volume of the arterial tree.

4507
Lay, F.
THE NURSE IN AEROMEDICAL EVACUATION. — Military Med., 116 (6): 455-457. June 1955. DLC (RD1.A7, v. 116)

Experiences and problems of nursing during air transportation of patients are reviewed. Mention is made of research dealing with: (1) the effects of flying on patients afflicted with various diseases; (2) technique and equipment; (3) resistance toward flights by certain patients; and (4) training of flight personnel.

4508
Lay, M. F.
[AVIATION MEDICINE, TODAY AND TOMORROW] Luchtvaartgeneeskunde, heden en morgen. — Nederlands militair geneeskundig tijdschrift (Gravenhage), 8 (8): 215-227. In Dutch. DLC (RC971.N4, v. 8)

The future branching out of aviation medicine into space medicine is contemplated. Space-equivalent conditions reached within the earth's atmosphere are discussed in regard to the availability of atmospheric oxygen, the body gases, the rarification of the atmosphere, cosmic radiation, ultraviolet rays, meteors, darkness and silence in space, and weightlessness. Other problems common to both space flight and aviation are posed by the sound barrier, the heat barrier, acceleration, and deceleration. Protective measures taken against extreme cold, hypoxia, acceleration and deceleration forces, tumbling of ejection seats, decompression sickness, and neurocirculatory collapse are reviewed. Visual problems of flight at high altitudes and supersonic speed are caused by changes in the light refraction index of air in front of the windshield and the visual latency.

4509
Lay, M. F.
[NEUROCIRCULATORY COLLAPSE AT HIGH ALTITUDE] Neurocirculatoire collaps op grote hoogte. — Nederlands militair geneeskundig tijdschrift (Gravenhage), 8 (10): 271-287. 1955. In Dutch. DLC (RC971.N4, v. 8)

The syndrome of neurocirculatory collapse appearing at high altitudes, either simulated in the pressure chamber or in flight, is reviewed in regard to its symptomatology, etiology, treatment, and prophylaxis.

4510
Lederer, L. G., 1954
and G. J. Kidera
PASSENGER COMFORT IN COMMERCIAL AIR TRAVEL WITH REFERENCE TO MOTION SICKNESS. — Internat. Record Med., 167 (12): 661-668. Dec. 1954. DLC (R11.M745, v. 167)

The incidence of airsickness depends on such factors as the type of plane, weather conditions, time of day, and seating arrangement of the aircraft. Adult females were found to be more susceptible to airsickness than males. A review is presented of the effective motion sickness remedies (Bonamine, Benacine, Dramamine, Marezine, Trimeton, and Seda-Stay). The premedication effect is stressed, showing that prophylactic treatment is more effective than treatment after symptoms are manifest. Included are seven tables.

4511
Lee, R. V.
DOES CIVIL AVIATION NEED DOCTORS? — Jour. Aviation Med., 26 (4): 337-338. Aug. 1955. DLC (RC1050.A36, v. 26)

This is a discussion of the role of the physician in civil aviation. The author feels that the specialist in aviation medicine does not have the opportunity to exercise the full scope of his talents in civil aviation medicine. He envisages a role for the civil physician practicing aviation medicine, namely to be responsible for his patients not only with regard to their physical health, but with regard to their emotional and mental well-being also. In addition, the civil aviation medicine specialist should be medical public relations officer, consultant to management in all health matters, industrial hygienist, and safety officer.

4512
Lee, W. A.,
and M. Freitag
THE CONCEPT OF RESPONSE RESTRICTION APPLIED TO DIAL READING. — Univ. of Virginia, Charlottesville (Contract W33(038)-ac-21269); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio (Project no. 7192). WADC Technical Report no. 54-364, April 1955. iv+13 p. AD 85 566 UNCLASSIFIED

An experiment was conducted to determine the effect of setting cues on accuracy of dial-checking during the simultaneous performance of a competing visual-motor task. Subjects were required to indicate by pressing appropriate keys with fingers of the left hand whenever a needle on one of four dials entered a "critical" zone. Simultaneously the subjects were engaged in a semi-tracking task

in which keys corresponding to four lights were required to be pressed by the appropriate fingers of the right hand when individual lights flashed (two per second). Four levels of cuing were used: (1) no cuing; (2) presenting a signal every time any dial moved; (3) signaling that a needle had entered a critical zone; and (4) signaling that a needle on one of two dials had entered a critical zone. Accuracy of monitoring was found to be significantly increased by the use of setting cues in proportion to the presumed degree of response limitation (1, 3, and 4). Condition (2) produced a performance improvement over Condition (1) which was not significant. The sense channel by which cues were presented (light or sound signals) did not influence the setting effects. Performance on the semi-tracking task was uninfluenced by the various setting conditions. (Quoted in part)

4513
Lee-Porter, P. B.
A BRIEF SURVEY OF AVIATION MEDICINE. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 5-11. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

The aeromedical problems of high speed and high altitude flight are briefly discussed. Topics considered include the physiological effects of acceleration, anoxia, and decompression, problems of escape and vision, and derivative questions of air crew selection and aeromedical indoctrination.

4514
Legeais, A.,
and R. Bertoni
[THE AERIAL HEALTH EVACUATIONS IN FRENCH EAST AFRICA] Les évacuations sanitaires aériennes en Afrique orientale française. — Médecine aéronautique (Paris), 10 (3): 259-276. 1955. In French. DLC (TL555.M394, v. 10)

The routine air evacuation of the sick in Madagascar, made necessary by the lack of adequate local medical facilities, is discussed. The system is unusual for its use of physicians on all aircraft and for the provision of medical treatment for patients at the local scene and during evacuation. The types of illnesses treated, equipment of the aircraft, medical equipment, and therapeutic measures utilized en route (including transfusions) are described.

4515
Legnani, F.
[NEUROPSYCHIATRIC SYNDROMES IN RELATION TO MOUNTAIN CLIMBING (TENTATIVE CLASSIFICATION)] Sindromi neuropsichiche in rapporto all' alpinismo (tentativo di classificazione). — Rassegna giuliana di medicina (Trieste), 11 (5): 160-162. May 1955. In Italian. DNLM

Included in a tentative classification of neuropsychiatric syndromes associated with mountain climbing are the following: (1) syndromes caused by low atmospheric pressure (altitude sickness, characterized by a period of euphoria followed by mental depression); (2) asthenic syndromes caused by fatigue due to muscular, nervous and mental factors or fatigue derived from mental tension; (3) syndromes caused by accidents (emotional and anxiety states, memory disorders); and (4) instinctive syndromes with mental conflict as related to mountain climbing (anxiety about reaching destination, self-preservation, insecurity).

4516
Lehalle, P.
[PSYCHOLOGICAL BASES OF THE PHYSICAL TRAINING OF THE PILOT] Bases psychologiques de l'entrainement physique de pilote. — Forces aériennes françaises (Paris), no. 103: 686-699. April 1955. In French. DLC (UG635.F8F66, v. 1955)

The physical training program for developing in pilots an attitude favorable to correct routine and emergency response is examined. The ideal pilot is characterized as an extrovert with rapid reactions, adaptability, vitality and alertness, who does not panic in emergencies. His ability to develop correct response reflexes is influenced by his accomodation abilities, personality set, and neuro-motor and intellectual characteristics. Motor, postural, and combined exercises are described which develop the correct response attitude; they are grouped according to their aims as those which (1) develop a specific simple response, (2) change a given set to an opposing one, (3) change generic responses to specific ones, and (4) coordinate several simultaneous responses.

4517
Lehmann, A.
[SOME PHYSIOLOGICAL EFFECTS PRODUCED IN THE RABBIT BY THE INHALATION OF COLD AIR] Quelques effets physiologiques provoqués chez le Lapin par l'inhalation d'air froid. — Comptes rendus de la Société de biologie (Paris), 149 (11-12): 1152-1154. June 1955. In French. DLC (QP1.S7, v. 149)

Rabbits maintained at room temperature while breathing air at -25° to -60° C. for from 2 to 7 hours exhibited a decrease in respiratory frequency of 75%, a decrease in body temperature of 1° to 3° C., and, in the case of animals breathing air at -60° C., a marked blood asphyxia. Histological examination showed no significant change in the number of polynuclear cells present in the lungs.

4518
Leibowitz, H. [W.]
EFFECT OF REFERENCE LINES ON THE DISCRIMINATION OF MOVEMENT. — Jour. Optical Soc. Amer., 45 (10): 829-830. Oct. 1955. DLC (QC350.Q6, v. 45)

The minimum discriminable target velocity was determined with and without reference lines in the visual field. At a short (0.125 sec.) exposure duration, where velocity discrimination is determined primarily by the magnitude of initial photochemical events, the velocity threshold is not changed by the introduction of reference lines. At a long (16 sec.) exposure duration, the presence of reference lines lowers the threshold velocity by 48%. The data are interpreted as supporting the hypothesis that movement is discriminated at slow speeds by observations of change in position. (Author's abstract)

4519
Leibowitz, H. W.,
N. A. Myers, and D. A. Grant
FREQUENCY OF SEEING AND RADIAL LOCALIZATION OF SINGLE AND MULTIPLE VISUAL STIMULI. — Jour. Exper. Psychol., 50 (6): 369-373. Dec. 1955. DLC (BF1.J6, v. 50)

Single and multiple stimuli were presented on the circumference of an imaginary circle for various luminance-exposure duration combinations. The subjects estimated the radial position of the stimulus or stimuli which varied in number from one to seven. It was found that, radial localization accuracy is independent of the variables of luminance and duration. An increase in the number of stimuli increases the radial localization error. Perception of a stimulus as an independent event was found to be true for a 0.32 mL/0.01 sec. luminance-duration combination, but not for a 5.12 mL/0.64 sec. combination. The mechanism of localization is not limited by the magnitude of the primary excitatory processes, the latter being completed before the localization mechanism is operative. (Authors' summary, modified)

4520
Leibowitz, H. W.,
N. A. Myers, and D. A. Grant
RADIAL LOCALIZATION OF A SINGLE STIMULUS AS A FUNCTION OF LUMINANCE AND DURATION OF EXPOSURE. — Jour. Optical Soc. Amer., 45 (2): 76-78. Feb. 1955. DLC (QC350.Q6, v. 45)

Accuracy of localization of the radial position of a single stimulus was determined for various luminance-exposure duration combinations. Localization accuracy, provided the stimulus is seen, is independent of luminance and duration, but varies with the radial position of the stimulus. The results are discussed in terms of event critical to localization and it is concluded that the magnitude of photochemical events in the end organs does not limit localization accuracy for supraliminal stimuli. (Authors' abstract)

4521
Leibowitz, H. W.
THE RELATION BETWEEN THE RATE THRESHOLD FOR THE PERCEPTION OF MOVEMENT AND LUMINANCE FOR VARIOUS DURATIONS OF EXPOSURE. — Jour. Exper. Psychol., 49 (3): 209-214. March 1955. DLC (BF1.J6 v. 49)

The threshold velocity for the perception of motion at a constant duration of exposure, designated the isochornal threshold velocity, is investigated for various luminance values and at five durations of exposure. Threshold velocity decreases with increasing luminance, rapidly at first and then more slowly before reaching a limiting value. With increase in duration of exposure, the threshold velocity-luminance function becomes less sensitive to luminance changes, and the entire functions are shifted to lower velocity values. The results are interpreted as reflecting the increased dependence of motion perception on the "inference" of movement at the longer durations of exposure and, under the same conditions, decreased importance of "critical" photochemical events to the perception of movement. (Authors' summary)

4522
Leibowitz, H. [W.],
N. A. Myers, and P. Chinetti
THE ROLE OF SIMULTANEOUS CONTRAST IN BRIGHTNESS CONSTANCY. — Jour. Exper. Psychol., 50 (1): 15-18. July 1955. DLC (BF1.J6, v. 50)

Luminance matches were obtained between a 1^{o} square test field viewed under variable illuminance and a photometric field of the same size. The function relating to the log matched luminance of the test field to the log of the ambient illuminance is linear over an illuminance range of more than 1,000,000 to 1. When the background against which the test field is viewed is either "black" or a "gray" of the same reflectance as the test field, the matches do not differ greatly from predictions based on energy relationships. When the test field background is "white" of higher reflection than the test field, the slope of the function is less and the data shifted to a lower position on the log matched luminance axis. The change in slope is a manifestation of brightness constancy. The shift in the ordinate position is a result of simultaneous contrast. It is concluded that one of the cues which tends to produce brightness constancy is a background of higher luminance than the test field (Authors' summary)

4523
Leibowitz, H. [W.]
SOME FACTORS INFLUENCING THE VARIABILITY OF VERNIER ADJUSTMENTS. — Amer. Jour. Psychol., 68 (2): 266-273. June 1955. DLC (BF1.A5, v. 68)

Same as item no. 1714, vol. II.

4524
Lemaire, R.,
G. Pille, and H. Ducros
[TREATMENT OF THE CONDITION OF MIXED DEHYDRATION] Conduite à tenir dans les états de déshydration mixte. — Médecine aéronautique (Paris), 10 (4): 469-472; discussion, p. 473. 1955. In French. DLC (TL555.M394, v. 10)

Three physiological states of dehydration are described, including intracellular dehydration caused by lack of water, extracellular dehydration caused by loss of electrolytes through sweating, and mixed dehydration in which both factors are present. In the latter case, lack of water is accompanied by lack of salt, and treatment requires administration of both salt and water.

4525
Lemaire, R.,
G. Pille, and H. Ducros
[INFLUENCE OF DESERT CLIMATE ON WATER ELECTROLYTE EXCHANGES] Influence du climat désertique sur les échanges hydro-électrolytiques. — Médecine aéronautique (Paris), 10 (3): 219-227. 1955. In French. DLC (TL555.M394, v. 10)

Unadapted subjects were exposed for a period of three days to hot, dry desert conditions with little exercise, under a controlled survival diet of 800 calories supplemented by up to 3 liters of water per day. Three subjects received supplementary NaCl rations. Physiological tests were conducted early on

the first day and after three days. It was found that after three days the deep temperature was elevated 1/2 to 1° C. over initial values, while the cutaneous temperature was elevated an average of 3° C. The quantity of water eliminated in urine decreased steadily to 400-700 ml., while the amount of water eliminated through sweat steadily increased. A maximum weight loss of 3% of total weight was recorded. A theoretical comparison of water ingested to water lost suggested the fact that the water loss resulted in an increased concentration of extra-cellular fluids. This theory is supported by an observed increase in blood proteins suggestive of a decrease in blood volume. In most subjects a drop in systolic pressure was recorded. The subjects experienced only minor discomfort throughout the experiment, although thirst was acute by the third day.

4526
Lemaire, R.,
and M. Boura
[THE EARLY SYNDROME OF INADAPTATION TO TROPICAL CLIMATES] Le syndrome d'inadaptation primitive aux climats tropicaux. — Médecine aéronautique (Paris), 10 (4): 465-467. 1955. In French.
DLC (TL555.M394, v. 10)

Three causal types of inadaptation to tropical climates are described: (1) malfunctioning of the thermoregulatory system through diseases of the skin or insufficiency of the sweat glands, (2) psychasthenia, particularly in women, which in tropical climates increases in severity, and (3) hypersympathicotonus, which is often manifested in tachycardia accompanied by systolic hypertension.

4527
Lett, J. E.
[OTITIS EXTERNA—CLINICAL STUDY] Otite externe—étude clinique. — Médecine aéronautique (Paris), 10 (4): 373-376; discussion, p. 376. 1955. In French.
DLC (TL555.M394, v. 10)

In 139 cases of otitis externa the most common symptoms were found to be pain, sensitivity, deafness, difficulty with chewing, and buzzing in the ears. The presence of cervical nodes, retro-auricular adenopathy, sensitivity of the ear opening, purulent discharge, and edema of the auditory canal were also noted. The patients were treated indiscriminately with either sulfadiazine, sulfamylon, or polymixine B. Treatment was changed if progress was not satisfactory. While the average treatment time was 8 days, with use of sulfadiazine it was 6.75 days. The number of Pseudomonas was increased four times in patients considered resistant to the drugs. Maceration is considered to be important in the appearance of the disease.

4528
Leusen, I.,
and G. Demeester
[EFFECT OF HYPOXEMIA ON THE PULMONARY CIRCULATION IN THE DOG AND CAT] Influence de l'hypoxémie sur la circulation pulmonaire chez le chien et chez le chat. — Acta cardiologica (Bruxelles), 10 (6): 556-575. 1955. In French, with English summary (p. 574).
DNLM

In the cat, acute hypoxia induced by the inhalation or insufflation of a mixture containing 8% oxygen increased the pulmonary arterial pressure. In the dog, acute hypoxia induced by a mixture of 7-10% oxygen generally increased the cardiac output without augmenting the pulmonary resistance. The dye-method of Stewart-Hamilton was found to be more reliable than the Fick method for determining cardiac output in hypoxia. (Authors' summary)

4529
Leushina, L. I.
[ROLE OF EYE MOVEMENTS IN DISTANCE ESTIMATION] O roli dvizhenii glaz v otsenke rasstoîaniîa. — Doklady Akademii nauk SSSR (Moskva), 101 (5): 849-852. 1955. In Russian.
DLC (AS262.S3663, v. 101)

Tests with human adults showed that movements of the eyes played an important part in distance evaluation.

4530
Levi M.,
and A. C. Higgins
SCREENING DEVICES FOR THE SELECTION OF SURVIVAL INSTRUCTORS. — Air Force Personnel and Training Research Center. Crew Research Lab., Randolph Air Force Base, Tex. Technical Memorandum CRL-TM 55-2, March 1955. iv-35 p. (Project no. 7713, Task no. 57151). AD 212 491
UNCLASSIFIED

The job of survival instructor and the development and validation of a selection procedure for it are described. The minimum requirements for the selection of survival instructor were:(1) the survival instructor must possess information about a variety of survival subjects and must be skilled in lecturing, demonstrating, and evaluating performance; and (2) he must have strong motivation for assignment as an instructor, independence of environmental props, ease in making changes, good interpersonal relationships, and facility in adapting to outdoor living. Results indicated that [the possession of] these requirements [by instructors] appeared to be effective in reducing attrition rate during the training process. (AD abstract)

4531
Lewis, D. H.
AN ANALYSIS OF SOME CURRENT METHODS OF G-PROTECTION. — Jour. Aviation Med., 26 (6): 479-485. Dec. 1955. DLC (RC1050.A36, v. 26)

A free swinging platform was mounted at a distance of 37 feet from the center of rotation on a human centrifuge; the subjects were seated in a simulated cockpit with lap belt and shoulder harness. The backrest was supinated at a 20-degree angle to the vertical. The dashboard in front of the subject was equipped with a single central red light for fixation and two green lights for peripheral vision. The subject could control the action of the centrifuge by means of a push-button switch at his right hand; upon activating the switch, a signal appeared upon the oscillograph record and the centrifuge stopped. The subject was instructed to signal at the instant peripheral vision was lost. Electrocardiograms, ear pulse,

and ear opacity were recorded. Four experimental experienced subjects were used. Under relaxed and unprotected conditions, loss of peripheral lights occurred within the g range of 2.5-4.75 g and within the time range of 9-15 seconds. The increase in minimum g tolerance acheived by protective devices or maneuvers was as follows: straining, 1.1 g; Navy Z-2 suit, 1.2 g; Z-2 suit plus straining, 2.2 g; and full-pressure half suit, 2.4 g.

4532
Lewis, D. H.,
and T. D. Duane
THE ELECTRORETINOGRAM IN MAN DURING BLACKOUT. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5514, Dec. 1, 1955. v+16 p. (Project NM 001 100 317, Report no. 1) AD 83 491 UNCLASSIFIED

Electroretinograms from five subjects were recorded on the human centrifuge under varying degrees of accelerative stress up to and including blackout and unconsciousness. These findings were correlated with changes in the retinal circulation and with the consensual light reflex. It was found that the electroretinogram could not be employed as an objective measurement of blackout since it persisted throughout all the experiments, as did the consensual light reflex. These findings indicate a likely origin of blackout in or near the ganglion-cell layer of the retina. (Authors' abstract)

4533
Lewis, D. H.
THE G-PROTECTION PROVIDED BY THE FULL PRESSURE HALF SUIT. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5511, Sept. 23, 1955. vi+23 p. (Project no. NM 001 100 310, Report no. 1). AD 79 881 UNCLASSIFIED

An evaluation was made of the g-protection provided by the full-pressure half suit. This was compared with the g-protection provided by straining, by the Z-2 suit, and by the combination of the Z-2 suit plus straining. It was found that, as presently designed, the full pressure half suit does not provide more protection than the combination of the Z-2 suit plus straining. Its acceptability is further limited by its cumbersomeness, lack of ease in donning, and by abdominal pain at maximum suit pressures. (Author's abstract)

4534
Lewis, N. D.,
and B. Engle
WARTIME PSYCHIATRY: A COMPENDIUM OF THE INTERNATIONAL LITERATURE. — vi+952 p. New York: Oxford University Press. 1954. DLC (Z6664. N514)

A compilation is presented of the important literature on psychiatry in World War II appearing between 1940-1948. Section II on aviation (pages 33-64) includes 44 references with abstracts on articles dealing with the problems of selection and classification of flyers, accident proneness and pilot errors, administration, combat reactions, demoralization and rehabilitation of aircrews, operational and emotional fatigue, neuroses and anxiety, and stress of aircrews. Other sections of interest deal with psychosomatic patterns, psychoneuroses, and problems of selection, induction, and training.

4535
Lewis, R. B.
LOCAL COLD INJURY: A CRITICAL REVIEW. — Amer. Jour. Physical Med., 34 (5): 538-578. Oct. 1955. DLC (RM735.A1O3, v. 3)

The following topics are included in a critical review of the literature on local cold injury: predisposing factors; acclimatization to cold; classification; pathogenesis; signs and symptoms; sequelae, and therapy. (142 references)

4536
Lewis, R. B.
THE NATURE OF COLD-INDUCED TISSUE INJURY. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 112-116. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

Rabbit legs exposed to an alcohol bath at -12° C. for 30 minutes showed acute degeneration of the muscle fibers 15 minutes after exposure, acute inflammatory exudation after 4-6 hours, and fibroblastic proliferation after 24 hours. After one week the necrotic muscle was almost completely replaced by connective tissue. Similar lesions were induced by heat (water at 52° C.), prolonged (3 hours) ischemia, and prolonged (72 hours) immersion at 2° C. Reduction of the temperature of the superficial layer at -5° C. by brief cold exposures produced three distinct types of lesion decreasing in severity with distance from the surface. Beneath a layer of coagulation necrosis (acute death) were seen a layer in which muscle cells were greatly reduced in size (slow death), and a layer of less severely atrophied cells. The rapidity of the pathological changes observed during cold exposure and their occurrence during prolonged immersion are indicative that ischemia and the formation of ice crystals are not causal factors in the observed tissue damages.

4537
Lightfoot, C.
CONTRIBUTION TO THE STUDY OF AUDITORY FATIGUE. — Jour. Acoust. Soc. Amer., 27 (2): 356-364. March 1955. DLC (QC221.A4, v. 27)

The effects of 3 minutes of strong acoustic stimulation (white noise or a 2-kc. tone at 105 decibels) on the auditory threshold for 3 or 4 kc. tones were determined in 24 subjects. Mean threshold recovery functions showed a typical "bounce" after an initial sharp decline; many individual functions, however, were monotonic. Largest inter-subject and smallest intra-subject variability were associated with the noise/4 kc. combination. Considerable individual variation was observed in general fatigability and recovery rate, and rank order tended to remain the same throughout the post-stimulatory period. There was a positive but low relationship between individual threshold recovery patterns under different fatiguing conditions; the relationship was generally highest after the first 3 minutes following stimulation. Many individual recovery charts displayed a roughness indicative of a recurring disturbance of considerably shorter duration than the bounce effect. There was no obvious relationship between threshold

shift and display of either roughness or bounce; nor could these latter two phenomena be entirely accounted for by tinnitus. (Author's abstract, modified)

4538
Lightfoot, C.,
and J. F. Jerger
CUMULATIVE EFFECTS OF REPEATED BURSTS OF WHITE NOISE ON THRESHOLD FOR 4000-C.P.S. TONE-PIPS. — Northwestern Univ., Evanston, Ill,; issued by School of Aviation Medicine, Randolph Field, Tex. June 1955. 10 p. (Project no. 21-1203-0001, Report no. 10). AD 75 199
UNCLASSIFIED

Cumulative effects of a 2-sec. burst of thermal noise on the threshold shift for 35-msec. tone pips were examined by tracing the threshold shift over the course of 100 successive noise bursts. A systematic increase in the threshold shift over the 100-burst series was observed. The degree of this cumulative phenomenon showed wide individual differences among subjects. It is concluded that, unless proper allowances are made, the repetitive stimulation required by burst-pip audiometry may be a source of serious error. On the other hand, the reaction of an ear to repeated stimuli may be a useful index of the ear's susceptibility to irreversible acoustic trauma. (Authors' abstract)

4539
Lightfoot, C.
EVALUATION OF THRESHOLD TRACING AUDIOMETRY AS A METHOD FOR STUDYING EFFECTS OF STRONG ACOUSTIC STIMULATION. — Northwestern Univ., Evanston, Ill.; issued by School of Aviation Medicine, Randolph Field, Tex. April 1955. 18 p. (Project no. 21-1203-0001, Report no. 8). AD 69 414 PB 118628

An audiometric procedure is described which involves the subject's tracing of his threshold by oscillating an attenuator and thus causing a test tone to fluctuate continually between audibility and inaudibility. This procedure was followed by a number of normal-hearing persons both before and after 3 minutes of strong (105 db. re 0.0002 microbar) acoustic stimulation. Data were thus provided to facilitate evaluation of the procedure as a possible means of measuring "fatigability", which was assumed to be a correlate of susceptibility to stimulation deafness. Four combinations of fatiguing sound (white noise or 2-kc. tone) and test tone (3000 or 4000 c. p. s.) were used for each subject. (Author's abstract)

4540
Lillehei, J. P.,
and B. Balke
STUDIES OF HYPERVENTILATION. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-62, July 1955. 6 p. AD 80 272 UNCLASSIFIED

Studies were made of the effect of hyperventilation on psychomotor performance and of the quantitative relationship of CO_2 depletion to hyperventilation tetany in normal young men. Lowering the alveolar CO_2 tension below 25 mm. Hg by hyperventilation was found to cause a significant impairment of the psychomotor performance as tested on the USAF SAM Complex Coordination Apparatus. Hyperventilation in a full-body respirator resulted in severe tetany when the CO_2 in the body was reduced an average of approximately 3.5 liters per square meter of body surface area. The size of the CO_2 reservoir was apparently not affected by ventilation rate or by the total time of hyperventilation. (Authors' abstract, modified)

4541
Linforth, R. L.
CREW EFFECTIVENESS IN THE B-52 STRATEGIC BOMBER. II. ENGINEERING FOR SAFETY AND EFFICIENCY. — Jour. Aviation Med., 26 (1): 13-17. Feb. 1955. DLC (RC1050.A36, v. 26)

A discussion is presented of the design of the forward crew compartment of the B-52 bomber in relation to the effective function of the crew members who must operate within this area. The prototype model of the compartment called for a tandem seating arrangement for the pilot and copilot on an upper deck, while the navigator and the bombardier sat side by side on a lower deck. However, it was discovered that two additional crew members would be needed to operate the craft, so the compartment design which was finally incorporated into the operational form of the bomber had the seating arrangement in pairs, side by side. Utilizing this arrangement, there was less chance of explosive decompression, because the canopy required for the newly designed cabin was comprised of several parts, each with its own escape hatch. Thus, in the event of crew evacuation, the entire canopy could remain intact as each member was evacuated through his escape hatch. Also, if it became necessary, each man could eject himself through the multipaned canopy. Heating was found to be simpler in the production type compartment, as was cooling. Defogging and defrosting controls were more effective in the second type cabin also, on account of the flat glass surfaces which allowed the use of thermal panes. Rain clearing on the windshields was more easily accomplished, and visual checking of instruments was readily done with the side-by-side arrangement of the seats. In addition, a less crowded instrument arrangement is possible because of the greater width of the production type cabin.

4542
Lins, W.,
A. L. Lobão, and C. Pontual
[LIPASE INDEX AND ALTITUDE] Índice de lipase e altitude. — Revista médica de aeronáutica (Rio de Janeiro), 7 (1-4): 31-37. Jan.-Dec. 1955. In Portuguese, with English summary (p. 36-37).
DNLM

An increase in the blood lipase index was observed in 49 pilot candidates and flight trainees exposed to a simulated altitude of 3,400 meters in a decompression chamber. This indicates that: (1) atmospheric decompression causes lipase mobilization in the blood, and (2) lymphocytic lipase takes part, together with oxidase processes, in internal respiration. (Authors' summary, modified)

4543
Lipscomb, F. E.
MILITARY HYGIENE IN TRANSITION. — Public Health (London), 68 (7): 97-101. April 1955. DNLM

With the advent of high-speed and high-altitude aircraft newer physiological problems confront the aircrew. The problems considered are centrifugal force; higher temperatures; linear acceleration and deceleration; escape from aircraft; cabin and cockpit pressurization; protective clothing; and solar radiations and ultraviolet light. The effects of speed on vision is noted. The need is emphasized for carefully selected, thoroughly trained air traffic controllers to handle aircraft in the air and on the ground calmly, quickly, and accurately. Medical officers and psychologists keep these men under constant surveyance to detect signs of tension and strain which prelude a breakdown. To the ground crew, the principle hazards are those of noise, fuels, temperature, and those associated with machinery (prevention of men from being sucked into, roasted, or blasted by jet engine). The application of industrial hygiene to the training of medical officers and the medical administration in the Royal Air Force is also discussed.

4544
Lisárraga Morla, L.
[ACUTE ALTITUDE SICKNESS: ACUTE PULMONARY EDEMA] Soroche agudo: edema agudo del pulmón. — Anales de la Facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Peru), 38 (2): 244-274. 1955. In Spanish. DNLM

A discussion is presented on the symptoms, pathogenesis, prognosis and therapy of acute pulmonary edema caused by acute altitude sickness, along with its hematological, X-ray and electrocardiographic aspects. Included are seven cases of disorder occurring in Peruvian natives living at high altitudes.

4545
Llano, G. A.
AIRMEN AGAINST THE SEA: AN ANALYSIS OF SEA SURVIVAL EXPERIENCES. — Arctic, Desert, Tropic Information Center. Research Studies Institute, Maxwell Air Force Base, Ala. ADTIC Publication G-104. 1955. 114 p. UNCLASSIFIED

A study is presented of sea survival experiences of airmen involved in an inflight emergency requiring abandonment of the aircraft. Included are chapters dealing with (1) the equipment used for survival (life vest, liferaft, clothing, first aid kits) and for rescue (visual and audio signals, electronic and radar aids, airdrop equipment); (2) the environment (drinking water, animal hazards, the sea); (3) the individual (physical and mental aspects); and (4) the rescue.

4546
Lobelle, M. J. O.
EJECTABLE SEAT FOR AIRCRAFT. — M. L. Aviation Co., Ltd., Slough, Eng. U. S. Patent 2,693,326. Nov. 2, 1954. 7 leaves. DP

An apparatus was designed to provide safe automatic ejection from aircraft after emergency landings and crashes on land and water. The device automatically opens a cover in the roof of the aircraft after a crash, and ejects the airman at a relatively low velocity which is just sufficient to throw him clear of the plane. The operation of the device may be initiated by immersion-or-impact-sensitive switches.

4547
LOCKHEED CHIEF TEST PILOT BLASTS "OUT-OF-DATE" SAFETY CONDITIONS. — Aviation Week, 63 (12): 27. Sept. 19, 1955. DLC (TL501.A8, v. 63)

Certain deficiencies of the T-1 partial pressure suit are exposed in connection with high-altitude flights.

4548
Lockman, R. F.
A CANONICAL ANALYSIS OF NAVAL AVIATION CADET CRITERION GROUP DIFFERENCES. — In: Research notes from the Aviation Psychol. Lab., p. 27-31. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 108 100.08, March 15, 1955. AD 74 676 UNCLASSIFIED

An analysis of data obtained from an "odd" sample of 859 Naval air cadets was conducted to identify components of the Mechanical Comprehension Test, Flight Aptitude Rating, and age selection measures, which enable the tests together to discriminate significantly between successful and attrition groups at the end of primary Naval air training. It was found that the variation between groups was produced chiefly by differences in degree along a single dimension loaded with a mechanical knowledge factor compounded with a small age factor.

4549
Lockman, R. F.
INVESTIGATIONS OF SOME ASSUMPTIONS BASIC TO PSYCHOLOGICAL TEST RESEARCH AND DEVELOPMENT WITH SELECTED NAVAL AVIATION CADETS. I. TESTS OF REGRESSION LINEARITY IN PREDICTING NAVAL AIR TRAINING CRITERIA FROM SELECTION MEASURES. II. COMPARISONS OF NON-NORMAL AND NORMALIZED PREDICTOR MEASURES. III. COMPARISONS OF WEIGHTED AND UNWEIGHTED PREDICTOR MEASURES. — Naval School of Aviation Medicine, Pensacola, Fla. Jan. 14, 1955. iv+[29] p. (Project no. NM 001 108 100.06). AD 68 734 UNCLASSIFIED

Three studies of naval aviation cadet selection measures and criteria of training success were conducted. The main emphasis was to test empirical assumptions basic to the accurate use and interpretation of validity statistics. The first report indicated than no upper limits for satisfactory performance in naval air training existed on two major selection tests for successful and attriting samples of cadets. The second report showed that normalization of truncated distributions of five selection measures did not increase their discriminatory or predictive efficiency. The third report demonstrated the worth of differentially weighting these five measures for discriminating successful from attrition groups. The general implication of all three studies is that important assumptions underlying accurate statistical analysis of predictor-criterion data relations are adequately satisfied when selected cadet samples are used. This provides greater assurance in the correct application and intrepretation of validation statistics in the Naval Air Training Program. (Author's abstract)

4550
Lodi, A.
[TESTS FOR THE EVALUATION OF AVIATION PERSONNEL] I "tests" per la valutazione del personale aeronautico. — Rivista aeronautica (Roma), 31 (9): 957-970. Sept. 1955. In Italian. DLC (TL504.R54, v. 31)

Tests used for the evaluation of aviation personnel are of two types; one tests potential capacity and is used in recruitment, selection, professional and scholastic orientation, and in initial classification; the other tests effective capacity and evaluates the intelligence of an individual in a specific field. It is used primarily after a course of study, or after training, and in classification of personnel. Tests tend to be objective and may include a complete series. A discussion is presented on the reliability, validity and concept of the tests. Rules are also included for the proper use of the tests.

4551
Loeb, M.
A FURTHER INVESTIGATION OF THE INFLUENCE OF WHOLE-BODY VIBRATION AND NOISE ON TREMOR AND VISUAL ACUITY. — Army Medical Research Lab., Fort Knox, Ky. Report no. 165, Jan. 24, 1955. ii+19 p. (Project no. 6-95-20-001). AD 55 065 UNCLASSIFIED

Subjects were exposed to two amplitudes of vibration at three different frequencies, to 115-db. broad-band noise, and to a control condition. Differential effects on visual acuity, manual tremor, and aiming tremor were found during exposure to different frequencies and intensities of vibration. Noise had no apparent differential effects. There were no significant differences in the experimental measures after vibration. (Author's abstract)

4552
Loebelson, R. M.
SOME ANSWERS TO THE JET NOISE PROBLEM. — Amer. Aviation, 18 (16): 19-20. Jan. 3, 1955. DLC (TL501.A675, v. 18)

Measures undertaken by the aircraft industry to abate jet noise in response to complaints of residents of test areas are described. Noise alleviation techniques include the use of engine mufflers and hangars as noise shields in ground tests, the use of special runways, restriction of flying hours, and attempts to promote a favorable or tolerant attitude in area residents.

4553
Lomonaco, T., 1953
and A. Scano
[FUNCTIONAL EXPLORATION OF THE RESPIRATORY AND CARDIOVASCULAR SYSTEMS FOR THE SELECTION AND PHYSICAL CONTROL OF FLIGHT PERSONNEL] Esplorazione delle funzioni degli apparati respiratorio e cardio-vascolare ai fini della selezione e del controllo fisico del personale aeronavigante. — Atti del V° Congresso di medicina aeronautica (Napoli, 1953). Parte II: Relazione, p. 1-164. In Italian, with English summary (p. 142-143). DNLM

Same as item no. 1743, vol. II.

4554
Lomonaco, T.
[BEHAVIOR OF BODY FUNCTIONS OF MAN LAUNCHED INTO SPACE] Comportamento delle funzioni corporee dell'uomo lanciato nello spazio. — Rivista aeronautica (Roma), 31 (6): 567-579. June 1955. In Italian. DLC (TL504.R54, v. 31)

Principal factors affecting the physiological and mental behavior of man traveling in space include those caused by: (1) living conditions within the space ship, affecting primarily respiration; (2) outside spatial radiations; (3) subgravity or zero-gravity conditions, affecting cardiovascular, respiratory and muscular function and the organs of equilibrium within the inner ear; and (4) acceleration, affecting the astronaut's movements within the spaceship.

4555
Lomonaco, T.,
F. Rossanigo, and B. Tagliamonte
[RESPIRATORY CONDITIONS DURING THE SO-CALLED STEP TEST] Le condizioni respiratorie durante la cosiddetta "prova dello scalino". — Rivista di medicina aeronautica (Roma), 18 (3): 642-654. July-Sept. 1955. In Italian, with English summary (p. 651-652). DLC (TL555.A1R5, v. 18).

Subjects performing the step test displayed a progressive increase in the average values of pulmonary ventilation, respiratory frequency and oxygen consumption in proportion to the duration of work. These values developed into a so-called steady state. Values obtained at the end of the test, in comparison to those obtained at the beginning, showed increases in pulmonary ventilation by 487%, in cardiac frequency by 107%, and in oxygen consumption by 834%. It is suggested that the height of the step be reduced to 30 cm., and that the test be extended to 10 minutes since the old method (50 cm. step, 5 minutes duration) does not attain a respiratory and cardiovascular steady state or provide definite data. More comprehensive data may be obtained prior to, during, and following the test.

4556
Lomonaco, T.,
and V. Masini
[EFFECT OF FLIGHT ON THE FORMATION OF GASTRO-DUODENAL ULCERS IN FLYING PERSONNEL] Influence du vol sur la formation d'ulcères gastro-duodénaux chez le personnel navigant. — Médecine aéronautique (Paris), 10 (4): 407-410. 1955. In French. DLC (TL555.M394, v. 10)

A statistical analysis of the occurrence of gastroduodenal ulcers among various groups of aviation personnel in Italy in 1942-1943 is presented. While the mean rate of occurrence of ulcers among personnel other than pilots (mechanics, radio operators, photographers, chauffers, etc.) was 0.45%, the rate of occurrence of ulcers in pilots was 1.07%. The difference in rate between the two groups is attributed to the stress on pilots of responsibility for the flying of the airplane, for navigation, and for the conduct of missions. The ulcers are considered to be part of a general adaptation syndrome among pilots.

4557
Lomonaco, T.
[EFFECT OF HIGH ALTITUDE FLIGHT ON SICKLE CELL ANEMIA] Influenza del volo a grandi altezze sull'anemia drepanocitica. — Rivista di medicina aeronautica (Roma), 18 (4): 922-934. Oct.-Dec. 1955. In Italian, with English summary (p. 931).
DLC (TL555.A1R5, v. 18)

A review is presented of cases previously reported in the literature of hemolytic crises occurring during high-altitude flight in persons with sickle cell anemia. A relationship to anoxic anoxia cannot be affirmed since hemolytic crises also occur in persons with sicklemia in normal conditions. Flight surgeons are alerted, especially in Italy where the disorder is present, to hemolytic crises arising from high altitude flight in passengers and in flight personnel. The importance is noted of detecting sickle cell trait during the selection of flight personnel, and it is stressed that affected persons be excluded from flight duty.

4558
Lomonaco, T.
[THE PROGRESSIVE PHYSIOLOGICAL AND MENTAL POTENTIAL OF MAN IN FLIGHT] Il potenziamento progressivo fisiopsichico dell'uomo in volo. — Rivista di medicina aeronautica (Roma), 18 (4): 960-967. Oct.-Dec. 1955. In Italian.
DLC (TL555.A1R5, v. 18)

A review is presented, with illustrations, on the history of aviation medicine including the human physiological studies at high altitude conducted by Angelo Mosso in 1877, and the high-altitude (17,200 meters) flight record set by Mario Pezzi in 1938. Progress in the field is discussed with reference to physiological studies (1) utilizing decompression chambers and human centrifuges, and (2) on the physiological problems (respiratory, nutritive, effects of subgravity and zero gravity) concerned with human intraspacial flight.

4559
Lomonaco, T.,
and G. Mazzella
[ON THE ACCELERATIONS THAT OCCUR DURING SOME BODY MOVEMENTS IN PARACHUTE LANDING] Sulle accelerazioni che intervengono durante alcuni movimenti del corpo nell'atterraggio con paracadute. — Rivista di medicina aeronautica (Roma), 18 (1): 68-77. Jan.-March 1955. In Italian, with English summary (p. 76).
DLC (TL555.A1R5, v. 18)

Accelerations in motion were studied in parachutists (with an accelerograph attached at the epigastric region) during landings from standard parachute jumps. Jumps were executed (without parachute) from a 1-meter-high springing-board. The subjects landed by flexing their legs and successively tumbling on their backs. Various stages of the landing were cinematographed and a photogram was made to correspond to its particular segment on the accelerographic curve. Analysis of the curve shows several positive and negative oscillations, a section corresponding to a subgravity state, and indicates that distribution of energy from the fall along the different regions of the body successively coming in contact with the ground is produced in a satisfactory manner.

4560
Lomonaco, T.
[INSPIRATORY RATE IN ANOXIC ANOXIA AS A METHOD OF INVESTIGATION OF RESPIRATORY FUNCTION] La vitesse inspiratoire dans l'anoxie anoxique comme méthode d'exploration de la fonction respiratoire. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 19-30. London: Butterworths Scientific Publications, 1955. In French, with English abstract (p. 30). DLC (TL500.N6, no. 6)

Resting subjects exposed to hypoxia by rebreathing showed an increase in respiratory rate and tidal volume, and a decrease in aleveolar pO_2 and pCO_2. Respiratory changes of greater magnitude but similar type were observed in subjects engaged in muscular exercise during hypoxia.

4561
Long, E. R.,
and W. D. Garvey
THE INFLUENCE OF SENSORY CHANNEL OF CUING ON THE IDENTIFICATION OF AURALLY PRESENTED DISTORTED WORDS. — Univ. of Virginia, Charlottesville (Contract W33(038)-ac-21269); issued by Wright Air Development Center, Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-361, April 1955. iv+22 p. (Project no. 7192). AD 85 565 UNCLASSIFIED

The intelligibility of distorted spondaic words presented aurally was determined under variable conditions of sense channel of setting cues (visual and auditory) and temporal position of cuing (pre-stimulus and/or post-stimulus). Subjects were cued by presentation of four alternative words, one of which was the same as the distorted stimulus word. All forms of cuing significantly improved the identification of distorted words. No relationship was observed between the sense channel used for cuing and that for stimulus presentation. Visual and auditory sense channel were equally effective in single cuing (pre- or post-stimulus), but the visual channel was generally more effective when an additional cue was presented. Pre-stimulus cuing was more effective than post-stimulus cuing.

4562
Long, E. R.,
and W. D. Garvey
THE ROLE OF SETTING CUES IN REDUCING THE SIMULTANEOUS LOCATION AND IDENTIFICATION AMBIGUITY OF LETTER PATTERNS. — Univ. of Virginia, Charlottesville (Contract W33(038)-ac-21269); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-289, April 1955. iv+19 p. (Project no. 7192). AD 85 56[illegible]
UNCLASSIFIED

Multiple (four) letter patterns with distorted contours were employed as ambiguous stimuli in studies designed to determine how setting cues (response restriction) might be used to facilitate letter identification in a situation in which simultaneous selection and identification response uncertainty was present. Degree of location response restriction was varied by denoting visually one to four stimulus letters to be considered. Degree of stim-

ulus distortion was varied by using letter patterns of three previously determined levels of difficulty. One-half of the subjects viewed four undistorted letter alternatives both before and after stimulus presentation, while the other half viewed these cuing letters only after stimulus presentation. Subjects were required to select and identify the one letter in each group which was identical to one of the cuing letters. The results indicate that facilitation of identification was brought about by locational cuing, but was statistically significant only when the response uncertainty had been reduced to zero (denotation of one letter). This result was independent of the level of stimulus difficulty and temporal position of figural cuing. The level of stimulus difficulty significantly influenced identification, while temporal position of figural cuing did not. (Quoted in part)

4563
Loveless, N. E.
MANUAL TRACKING ON HORIZONTAL AND VERTICAL LINEAR SCALES. — Univ. of Durham (Gt. Brit.). Nuffield Department of Indus. Health; issued by Flying Personnel Research Committee (Gt. Brit.). FPRC 914, March 1955. 16 p. AD 65 155
UNCLASSIFIED

In a compensatory tracking task, measures of speed and accuracy of tracking were obtained under both display-control relationships for horizontal and vertical scales and for targets at the four cardinal points of a circular scale. With a horizontal scale, speed and accuracy were greater when a clockwise control movement caused the pointer to move to the right, whereas with a vertical scale, they were greater when a clockwise control movement caused the pointer to move upwards. Performance on the horizontal scale was more consistent and superior to that on the vertical, and comparable to that obtained on the circular scale under optimal conditions (direct drive, target in top or left-hand quadrant). Linear scales are considered preferable to circular scales in circumstances where the ambiguous control-display relationships of the latter are undesirable.

4564
Luder, P. 1954
[AN ATTEMPT TO EVALUATE THE RELATIONSHIP BETWEEN THERMOREGULATION OF HEALTHY MALE SUBJECTS IN EXTREME HEAT AND COLD WITH THEIR ADRENAL FUNCTION] Ein Versuch zur Beurteilung des Zusammenhangs der Thermoregulation gesunder männlicher Versuchspersonen in extremer Hitze und Kälte mit ihrer Nebennierentätigkeit. — Schweizerische Zeitschrift für Sportmedizin (Genève), 2: 68-82. 1954. In German, with English summary (p. 81). DNLM

Fourteen healthy male volunteers between the ages of 21 and 25 years were exposed to extreme temperatures in refrigerated rooms or in a sauna bath for periods of 20 to 30 min. In approximately 50% of the cases, the blood analysis made after the cold or heat exposure showed a leukocytosis with eosinopenia and an increased thrombocyte count. These were taken to be signs of an increased adrenal cortex activity. Thermoregulatory changes of the internal and surface temperatures of the body, of oxygen consumption, pulse rate, blood pressure, respiratory rate, capillary permeability, blood cholinesterase, and bronchial resistance appear to be independent of changes in the blood count. The results are discussed in relation to the function of the adrenal cortex in the thermoregulatory system of the human organism. (Author's summary)

4565
Ludvigh, E.,
and J. W. Miller
THE EFFECTS ON DYNAMIC VISUAL ACUITY OF PRACTICE AT ONE ANGULAR VELOCITY ON THE SUBSEQUENT PERFORMANCE AT A SECOND ANGULAR VELOCITY. — Kresge Eye Inst., Detroit, Mich. (Contract Nonr-586(00)): issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 9, June 1, 1955. iii+10 p. (Project no. NM 001 110 501.09). AD 66 690

It has been previously shown that visual acuity deteriorates as the angular velocity of the test object, relative to the observer's eye, is increased. It has also been shown that there is a substantial amount of improvement, with practice, at high angular velocities and a lesser amount at low angular velocities. The present study was designed to demonstrate whether or not there is transfer of training from 20°/sec. to 110°/sec. angular velocity of test object and conversely whether or not there is transfer from 110°/sec. to 20°/sec. angular velocity. It was found that there was transfer of training in both instances but that there was considerably more in proceeding from the low to high angular velocity. (Authors' abstract)

4566
Ludvigh, E. J.
VISUAL AND STEREOSCOPIC ACUITY FOR MOVING OBJECTS. — In: Office of Naval Research, Symposium on physiological psychology, p. 125-136. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100 UNCLASSIFIED

Some of the experiments are discussed in which the object viewed apparently moved in a circle in a plane perpendicular to the line of sight. The apparent motion of the stimulus-object was achieved by looking at it through prisms of different strengths rotated at varying speed. The visual acuity deteriorates with increasing velocity of the test object. Extrafoveal location of the image is a relatively unimportant factor in the loss of acuity. Rather, it is the movement of the image which causes the loss of acuity. This is thought to be due to inaccuracy of control of the eye explained in terms of exteroceptive and parametric feedback.

4567
[Luehrs, R. E.]
AVIATION SAFETY AND ALLIED PROBLEMS. — In: Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 263-278. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955.
DLC (RC1062.U52)

The procedures are outlined for assisting the flight surgeon in rescue operations and in the investigation and reporting of aircraft accidents. A discussion on aerial evacuation of patients includes: criteria and conditions; role of the naval flight surgeon and aircrew; classification of patients; obtaining air space for patients; and the evacuation of wounded and sick from battle areas.

4568
Luehrs, R. E.
EPILEPSY AMONG NAVAL AVIATORS. — Contact (Pensacola), 13 (1): 28-29. 1955. DNLM

A brief discussion is presented on a research program functioning to obtain an electroencephalographic tracing on all flight candidates, utilizing hyperventilation and photic stimulation to provoke tendencies toward epileptoid reactions. The information obtained is to be analyzed, stored, and later correlated with grades and fleet performances. This program will be of value in investigations of after-crash pathology of pilots, in the selection of subjects for flight training, and in establishing the value of anxiety proneness in aviation.

4569
Luehrs, R. E.
MERCY MISSION IN HONDURAS. — Med. Technicians Bull., 6 (1): 1-4. Jan.-Feb. 1955. DNLM

A note is presented on the helicopter medical mission to Honduras following the devastation caused by hurricane "Gilda". Army and Navy helicopters flew medical officers and hospital corpsmen to the stricken areas; rescued stranded families; evacuated flood victims; and brought in food supplies.

4570
Luehrs, R. E.
OPERATIONAL PROBLEMS IN AVIATION MEDICINE. — In: Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 245-261. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

The naval flight surgeon's role is discussed in establishing and maintaining morale, diagnosing and treating diseases, and in removing pilots from flight status for reasons of mental and physical incapacitation. Consideration is given to his charge and duties aboard an aircraft carrier such as in maintaining the health, morale, and outlook of personnel. The mission, operational organization, communications net, craft and procedures of air-sea rescue are presented including survival procedures on land or water. The use of medication by passengers or the aircrew during flight is also noted.

4571
Luft, U. C.
EXPIRATORY RESISTANCE AS DETERMINED FROM TRANSTHORACIC PRESSURE DURING DECOMPRESSION. — Federation Proceedings, 14 (1[I]): 96. March 1955. DLC (QH301.F37, v. 14)

Transthoracic pressures were recorded during double-chamber decompressions in subjects performing breath-holding with open airways at the resting respiratory level. The peak pressure was observed to increase in relation both to the differential of decompression (p_1-p_2), which varied from 150 to 503 mm. Hg, and to the decompression ratio (p_1-p_2)/p_1. In experiments conducted on a model consisting of a large bottle with a fixed orifice, transmural pressures followed the pressure differential of the compartment but were independent of the pressure ratio. The decay of the transthoracic pressure was consistent regardless of the pressure range employed, and permitted, with knowledge of the lung volume, an estimate of the expiratory flow resistance in terms of the effective cross-sectional area of the airway. In 12 determinations in one subject resistance was found to correspond to a circular orifice with a diameter of 4.9±0.3 mm.

4572
Lundberg, U.
STUDIES IN BLOOD SUGAR DURING DIFFERENT STRESSES IN AIR FORCE PERSONNEL. — (Thesis, Faculty of Medicine, Lund, April 5, 1955) Malmö: CWK Gleerup, 1955. 123 p. DNLM

A series of blood-sugar investigations were carried out on 42 pilots and 113 recruits in the Swedish Air Force. Blood sugar was determined after their normal activity, after fasting stress, glucose-tolerance test, and flight activity. Complementary investigations included height-weight index, orthostatic test, catechol output in the urine, eosinophils, and age. A statistically reliable difference was observed in the carbohydrate metabolism of pilots as compared to recruits chosen at random. Low blood sugar noted in a number of cases was not associated with symptoms of hypoglycemia. The blood sugar increases or decreases after a meal or a glucose dose show a definite relationship to the fasting value and to the middle value of the blood sugar curve. The lower limit of a normal decrease regardless of the stress employed is approximately 16%. There is no correlation between the changes in blood sugar and other physiological indices. Certain conclusions were drawn in respect to the composition, size and time of meals for pilots before flight. There seems to be a connection between low blood-sugar values and "flying fatigue". (161 references)

4573
Lundgren, N. P. V.
RECENT ADVANCES OF INSTRUMENTATION OF INTEREST IN AVIATION MEDICINE. III. COMPARISON OF RAHN-OTIS TECHNIQUE WITH OTHER METHODS OF INTERMITTENT AND CONTINUOUS SAMPLING OF EXPIRED AIR. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 104-111. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

A method was developed for obtaining end-expiratory air from the oropharynx by a syringe inserted through a catheter in the mouth. The sample was emptied into a rubber ballon, and continuous gas samples were removed for analysis by the Haldane technique or by automatic gas analyzers. Comparisons between data obtained by this method and those obtained by the Rahn-Otis technique showed good agreement over a wide range of resting tidal volumes and respiratory rates. Studies of the time delay due to mixing with residual gas in the Rahn-Otis sampler during large changes in the composition of expired air were made with a nitrogen meter during a shift from air to oxygen breathing. An observed delay of half a respiratory cycle and a significant mixing delay became insignificant within three minutes after the shift.

4574
Luria, L.
[RESPIRATORY MODIFICATIONS IN ACUTE HYPOXIA CAUSED BY REBREATHING] Modificazioni respiratorie in ipossia acuta da rirespirazione. — Bolletino della Società italiana di biologia sperimentale (Napoli), 31 (1-2): 41-43. Jan.- Feb. 1955. In Italian. DNLM

Non-athletes and athletes, including mountain climbers, rebreathed a mixture of 8% O_2 in N_2 (comparable to an altitude of 6800 meters, decreasing after 3-4 minutes to 4.5%-5.5% O_2 in N_2 or a simulated altitude of 8000-9000 meters). Non-athletes demonstrated an increase in respiratory amplitude during the first minutes of the experiment. After 3-4 minutes, respiratory frequency increased by 35%, and pulmonary ventilation showed a gradual increase, finally becoming stationary. In athletes the respiratory response to hypoxia was more pronounced; an increase was exhibited in pulmonary ventilation which was parallel to an increase in respiratory amplitude and with slight modifications of respiratory frequency.

4575
Lyman, C. P.,
and P. O. Chatfield
PHYSIOLOGY OF HIBERNATION IN MAMMALS. — Physiol. Reviews, 35 (2): 403-425. April 1955. DLC (QP1.P45, v. 35)

A review is presented of the physiological phenomena of hibernation in rodents and insectivores. Changes occurring during entrance into and arousal from hibernation in the endocrine system, utilization of fat, temperature, circulation, metabolism, nervous system activity, acid-base balance, blood sugar, blood, and growth are considered. The common theories of hibernation are also discussed. (170 references)

4576
McBride, P. I.,
D. E. Johannsen, and J. W. Wulfeck
THE EFFECT OF PRE-EXPOSURE ON DARK ADAPTATION: AN ANNOTATED BIBLIOGRAPHY. — Tufts Univ., Medford, Mass. [AF 30 (602)-199]; issued by Armed Forces - NRC Vision Committee, Ann Arbor, Mich. June 1955. vi+69 p. AD 102 071 UNCLASSIFIED

This annotated bibliography emphasizes the following: (1) the influence of brief durations and low brightnesses of preceeding light upon the course of dark adaptation, and (2) the influence of wavelength variable in pre-exposure upon subsequent adaptation to various wavelengths. An attempt is made to annotate each entry in such a way as to eliminate the necessity of seeing all papers in the original for purposes of review, evaluation, or further experimentation. Coverage of references is intended to be comprehensive through the Spring of 1954.

4577
McCann, J. G.
SAC'S SAFEST YEAR. — Combat Crew (Strategic Air Command), 5 (8): 4-6. Feb. 1955. DLC

The accident, fatal accident, fatality, and destroyed aircraft rates of the Strategic Air Command during 1954 were the lowest recorded to date. Landing accidents accounted for 45% of the total, in-flight accidents for 34%, and takeoff for 11% of the total. Forty-five per cent of all accidents were attributed to pilot error.

4578
McClatchie, S.
NINE MONTHS WITH THE PARATROOP MEDICS. — Military Med., 117 (6): 508-512. Dec.1955. DLC (RD1.A7, v. 117)

Charts are presented showing the number and nature of parachute injuries that may occur from the time man leaves the plane until he is free of his harness. Prominent are injuries to the face, neck, spine, shoulder, elbow, arm, hand, thorax, abdomen, lumbar region, pelvis and hip, thigh, knee, leg, ankle, and foot.

4579
McCoy, N. W.
NOW WE KNOW! — Combat Crew (Strategic Air Command), 5 (8): 16-19. Feb. 1955. DLC

The successful bailout of the crew of a B-47B without ejection seats is described.

4580
McCutchan, J. W.,
and C. I. Taylor
A QUANTITATIVE STUDY OF EVAPORATION FROM THE HUMAN BODY DURING SHORT EXPOSURES TO VARIOUS TEMPERATURES, HUMIDITIES, PRESSURES, AND MASS VELOCITIES. — Univ. of Calif., Los Angeles (Contract AF 33(616)-32); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-522, June 1955. v+41 p. (Project no. 7155). AD 98 216 UNCLASSIFIED

This report provides an example of an economical design of a physiological experiment using the Latin Squares Technique. Variation in human perspiration, evaporation from the skin, and skin and rectal temperatures are expressed as functions of the environmental variables of air temperature, water vapor pressure, pressure, and mass velocity over the specified ranges. The beneficial effect of reduced pressure on body temperature and heart rate is striking and correlates with the subjective reports. The hypothesis is offered that variations in barometric pressure affect only the diffusional component of skin water loss while body temperature controls the sweat gland component. Computations favorable to that view have been made although direct experimentation is necessary to establish the validity of the hypothesis. (Authors' abstract)

4581
Macdonald, J. S. 1955
DESERT RESCUE: THE PARACHUTE MEDICAL TEAM. — Jour. Royal Army Med. Corps (London), 101 (1): 28-32. Jan. 1955. DNLM

The Army Parachute Medical Team is a unit of the British Royal Air Force desert rescue organization. It exists to provide aid during the interval between the sighting of a desert air crash from the air and the arrival of the ground rescue team. It consists of a medical officer and seven corpsmen. Equipment, including medical supplies, food, water, and wireless are carried on the man. The team is equipped to deal with shock, exposure, burns and fractures, and to do minor surgery. It relies on the ground rescue team to extricate its patients and itself from the desert.

4582
MacDonald, T. C.
CHANGING CONCEPTS IN AVIATION MEDICINE. — Jour. Aviation Med., 26 (6): 463-466. Dec. 1955. DLC (RC1050.A36, v. 26)

Two instances are cited where the application of classic techniques of medical science has resulted in successful solutions to problems concerned directly with aviation medicine. The first mentioned deals with visual problems at high altitudes, specifically, those caused by reversed light distribution and those resulting from the empty visual field. Veiling glare and dazzling glare both result from reversed light distribution; the former is overcome by the use of a visor over the pilot's face, and the latter by proper lighting of the cockpit. Myopia, impaired depth perception, and impaired judgment of speed result from the lack of objects upon which the eye can focus in accommodation for distant vision when the pilot is flying at extreme altitudes; also contributing to this condition is the fact that there are no background objects of known size and the absence of parallactic displacement at high flight levels. This problem is under continuous study. The need for a link between aviation medicine and forensic medicine is also discussed, and the Comet airplane accidents are briefly described as instances where the application of the principles of the injuries observed at the postmortem examination of the bodies showed evidence of resulting from violent explosive decompression, traumatic impact with the sea, kerosene fire scalds, and sunburn occurring after death.

4583
McFarland, R. A.
AGING IS AIRMAN'S GREATEST FOE. — Aviation Week, 62 (3): 108. Jan. 17, 1955. DLC (TL501.A8, v. 62)

The functional capacity and efficiency of the pilot declines with advancing age though not parallel to his chronological age. The changes in vision, dark adaptation, hearing, reaction time, and overall performance are reviewed in relation to age. It is suggested that the functional age be evaluated on an individual basis for each pilot in the age range of 50±5 years.

4584
McFarland, R. A., and M. B. Fisher
ALTERATIONS IN DARK ADAPTATION AS A FUNCTION OF AGE. — Jour. Gerontol., 10 (4): 424-428. Oct. 1955. DNLM

The following conclusions are drawn from a study of dark adaptation using the Hecht-Shlaer adaptometer in male subjects between 20 and 60 years of age: (1) there is a consistent decline in ability to see at low levels of illumination with increasing age; (2) the final level of dark adaptation is clearly a function of age; and (3) the limitation in ability for dark adaptation is quite marked in older subjects and is possibly related to certain basic physiological functions in the cerebral and retinal nerve cells. The practical significance of these findings is noted with reference to the difficulties experienced by persons over 55 to 60 years of age in night flying, and to the safety problems arising from reduced illumination through the use of tinted windshields or the use of colored glasses. (Authors' summary, modified)

4585
McFarland, R. A.
HUMAN PROBLEMS ASSOCIATED WITH HIGH-SPEED AND HIGH-ALTITUDE FLIGHT. — Trans. Amer. Soc. Mech. Engin., 77: 747-758. July 1955. DLC (TJ1.A7, v. 77)

Human tolerance for heat and cold is outlined to communicate to aeronautical engineers a more profound understanding of the design problems related to the cabin atmosphere. Hazards resulting from noxious gases and vapors are also considered. The need for air-crew indoctrination in the effective use of equipment is emphasized as well as the need for airmen to understand their own physical limitations while in flight. Finally, the need for more effective collaboration between the biological and engineering sciences is stressed in regard to improving the man-machine systems in high-speed and high-altitude flying. (Author's abstract, modified)

4586
McFarland, R. A.
RESEARCH IN THE FIELD OF ACCIDENTAL TRAUMA. — Military Med., 116 (6): 426-435. June 1955. DLC (RD1.A7, v. 116)

An analysis is presented of the causes of accidents, including aircraft accidents, utilizing the epidemiological approach. This approach incorporates: (1) research on host factors, such as human characteristics, age factor, characteristics of accident repeaters, and the influence of temporary states and conditions (fatigue); (2) research on host-agent (human engineering) relationships, including the role of faults of design and operation of equipment, advance analysis of equipment, and crash injury research; (3) research on host-environment relationships (visibility at low levels of illumination, effect of temperature and humidity, and the role of the social environment). Integration of these research data into an effective accident control program is discussed.

4587
Maciolek, J. A.
CIRCULATORY REFLEX ACTIVITY AS A G-PROTECTIVE DEVICE. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical Note WCRD 55-1, Jan. 1955. iii+5 p. (Project no. 7216). AD 75 056 UNCLASSIFIED

The response on the human centrifuge of seven seated subjects to positive accelerations of normal rapid onset (1 g/sec.) has been compared with their tolerance in runs having 0.07 to 0.1 g/sec. rate of onset. The approximate blackout threshold of the group was 3.7 g for the standard runs. The runs of slow onset attained 6.2 g before equivalent symptoms occurred. The 2.5 g difference in symptom level is a measure of the response of the various hemostatic mechanisms tending to sustain blood pressure in man exposed to a gravitational stress which is acting from head to foot. This technique appears to be a simple and practical method of evaluating the activity of these protective reflexes in different persons and in the same person under varying conditions. Practical applications of these findings in ferrying and bomber operations are discussed. (Author's summary)

4588
Mackensen, G.
[OBSERVATIONS OF THE PHYSIOLOGY OF OPTOKINETIC NYSTAGMUS: THE DEPENDENCE OF THE EYE MOVEMENT PATTERN ON THE SPEED OF THE STIMULUS] Untersuchungen zur Physiologie des optokinetischen Nystagmus: Änderung der Zuckungsformen in Abhängigkeit von der Geschwindigkeit des Reizmusters. — Albrecht von Graefes Archiv für Ophthalmologie (Berlin), 156 (5): 535-546. 1955. In German. DNLM

The patterns of eye movements in nystagmus were observed in a series of experiments to vary with the speed of turning. An increase in the speed of turning to a limited value produced a progressive rise in the frequency and amplitude of the movements. With a further increase in speed, a larger and slower pattern appeared which either replaced or overlapped the original pattern. The latter phenomenon was seen as a rhythmic displacement of the center of oscillation. The accuracy of the use of an average value of amplitude and frequency as a measure of nystagmus is thus questioned.

4589
Mackersey, I. 1954
RESCUE BELOW ZERO. — 214 p. New York: W. W. Norton and Co., 1954. DLC (G743.M27)

A narrative is presented of the air evacuation of an air crew marooned for nine days at an isolated camp in Greenland by the crash of their aircraft during supply-dropping operations.

4590
MacKinnon, D. C.
OTOLARYNGOLOGY IN AVIATION MEDICINE. — In: Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 81-112. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

A discussion of otolaryngology in aviation medicine includes the following: (1) anatomy (with illustrations) and physiology of the external ear and auditory canal, middle and internal ear, and the nose and paranasal sinuses; (2) physiology of hearing and of the nose; (3) examination of the ear and functional tests (hearing tests utilizing the conversational and whispered voice, tuning forks, whistles or the monochord, and the audiometer); and (4) pathological and therapeutic aspects of auricular frostbite, foreign bodies in external auditory canal, tympanic membrane injuries, aerotitis media, myringitis bullosa, otitis media, common cold, respiratory allergies, aerosinusitis, sinusitis, deflection of nasal septum, epistaxis, oral and pharyngeal infections.

4591
Mackworth, J. F.,
and N. H. Mackworth
THE OVERLAPPING OF SIGNALS FOR DECISIONS. — Medical Research Council (Gt. Brit.). Applied Psychology Research Unit, Cambridge. Unnumbered report, [1955]. 23 p. AD 119 043
UNCLASSIFIED

Human limitations were sought in the rate at which each signal in a continuous series could be accurately matched. The physical measure devised was the index of signal-overlap which is the sum total in seconds of the various periods during which the given signal is overlapped by any other signal. A task in which objects had to be matched confirmed the great disadvantage for skilled achievement when further physical sources of demands for action are added to a serial visual presentation. These difficulties are experienced even when there is no change in the average number of signals presented per unit time. A linear relationship was demonstrated for the regression of missed signals on signal-overlap: the greater the peak stress, the higher the proportion of failures which are caused by missed rather than wrong decisions. Most of the multi-channel effect can be traced to peak speed stress. Statistical analysis suggested that more display channels may have further effects. (From the AD abstract)

4592
Mackworth, N. H.
COLD ACCLIMATIZATION AND FINGER NUMBNESS. — Proc. Roy. Soc. (London), Series B. 143 (912): 392-407. March 15, 1955.
DLC (Q41.L7, v. 143)

The fingers of volunteers living in the sub-Arctic (termed either indoor or outdoor men according to the amount of time they usually worked outside) were exposed for 6 minutes to air temperatures of -16° to -25° C. at wind speeds of about 4 m.p.h. The increase in the threshold of two-point tactile discrimination was found to be seven times greater for the indoor men, although both groups had equally sensitive fingers before cold exposure. A smaller difference was found in vibration-detection thresholds. The indoor men showed a marked increase in their two-point thresholds over a large range of wind-chill conditions, while the outdoor men showed no such alteration in sensitivity. Extremely severe exposures, however, gave equally marked numbness in both groups. Higher skin temperatures after exposure, observed particularly in outdoor men along with higher temperatures before exposure, were associated with lower threshold scores. The differential effect of chilling was found to be reduced sharply in still-air exposures. It is suggested that the outdoor men may have developed a greater resting finger blood flow which more effectively maintained their finger warmth and tactile discrimination. Cold-room experiments showed that short daily exposures have a cumulative effect during winter time, but not in summer, the increase in the two-point threshold after chilling being halved in 2 to 5 weeks.

4593
McMahan, C. A.,
J. K. Folger and T. R. Ford
LONGEVITY OF RETIRED ARMY AND AIR FORCE OFFICERS. — Human Biol., 27 (2): 125-137. May 1955. DNLM

The life expectancy of a population of 10,001 U. S. Army and Air Force officers living in retirement between January 1, 1925 and December 31, 1948 was studied by means of current life tables. For the retired population, age-specific death rates were higher at ages 65 than were rates for corresponding ages among the white population in 1939-1941. Above 65, rates were lower for the retired officers. The mortality for retired officers at younger ages probably reflects (1) the earlier base period for the retired officer death rates, and (2) the reasonably expected lesser longevity of officers retiring at younger ages. Mortality rates are lower for officers retiring recently than those retiring earlier. Factors affecting an increasing longevity for the general population appear to operate among this retired population. Representative tables and graphs are included.

4594
McMullen, J. J.
MOTION SICKNESS. — Jour. Royal Naval Med. Service (London), 41 (1):23-35. Winter 1955. DNLM

A review of the literature on motion sickness is presented with special emphasis on the following aspects: symptoms, psychogenic theory; as a problem in World War II, susceptibility and adaptation; etiology; the vestibular apparatus; the effect of head position; treatment and research. (33 references)

4595
McNeil, W. J.,
and C. H. Suelter
AIRCRAFT SEWAGE DISPOSAL. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-504, April 1955. v+8 p. (Project no. 6356). AD 75 798 UNCLASSIFIED

The systems of waste removal now in use in aircraft are described, and their disadvantages are discussed. Standards for the establishment of an ideal aircraft sewage system are presented and compared with systems under development, including biological treatment, improvement of storage toilets and associated servicing equipment, incineration, and overboard discharge of wastes. It is suggested that, if feasible, inflight discharge of waste be adopted.

4596
McNeil, W. J.,
and G. W. Hogan
INFLIGHT DEFECATION RECEPTACLE. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-139, May 16, 1955. iii+10 p. (Project no. 6356). AD 80 859 UNCLASSIFIED

A receptacle was developed in anticipation of a need of the fighter pilot to defecate during extended missions. It was designed as an inflatable device of vinyl plastic, generally bed-pan shaped, and intended for use inside the flyer's clothing by inserting it through the unzippered fly. An outer bag, into which a pneumatic inner tube was sealed, and with a draw string type of closure as compared with two types of zippered opening arrangements, was preferred of the three types fabricated. Also, inflation of the device by hand was preferred to carbon dioxide or nitrogen inflation. In use tests, especially wearing the exposure suit, it was very difficult to insert the device through the opened fly and arrange it inside the clothing. It was decided that the basic idea for insertion and use inside of clothing is impractical. Futhermore, none of the subjects in the laboratory 24-or 56-hour cockpit tests experienced a need to defecate. In light of these findings, it is believed further investigation into the basic requirement should be accomplished before further development of the receptacle is pursued. (Authors' abstract)

4597
McNiven, M.
THE EFFECTS ON LEARNING OF THE USEFULNESS OF THE MATERIAL TO BE LEARNED. — Pennsylvania State Univ., University Park, Pa. (Contract N6onr-269); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 269-7-54, Aug. 30, 1955. 33 p. (SPECDEVCEN Project 20-E-4). AD 109 247 PB 124649

A rating form and attitude scale were developed and tested to discover whether material that was perceived to be useful was learned better than material that was not. The learning task was learned from the following instructional films: (1) Help Wanted (a first-aid film); (2) Atomic Energy (structure of the atom and principles of atomic research); and (3) Know Your Car (the fundamental parts of a car and their function). The subjects for testing included 473 high-school seniors. The three types of measures used were information tests, the ranking and rating form, and the attitude scale. The nearer an individual perceives himself to be to the use of the information contained in the film, the greater will be his learning from that film. A reliable scale was developed which measures how useful or revelant material appears to be to the trainee. (AD abstract)

4598
Magill, A. M.,
and J. P. Marbarger
SURVIVAL TIME DURING EXPOSURE TO SEVERE HYPOXIA IN THE RAT TREATED WITH ADRENOCORTICOTROPHIC HORMONE. — Jour. Aviation Med., 26 (4): 308-318. Aug. 1955. DLC (RC1050.A36, v. 26)

Survival time and cumulative mortality rates of male and female albino rats exposed to severe hypoxic stress were studied. There were 4 groups: a control group (I), an altitude-adapted group (II), a group treated with a total dose of 3.5 units of ACTH (III), and a group which received 10.5 units of ACTH (IV). Group II was exposed to 18,000 feet simulated altitude for 3 weeks prior to the survival-time study. In the experiments the animals were placed in a decompression chamber, and were decompressed at a rate of approximately 2000 feet

per minute, to a simulated altitude of 35,000 feet. Survival-time data indicated the appearance of a trend toward greater than control-time values in the animals which had received 1.5 units of ACTH per day (total dose, 10.5 units). Animals on a lower dose of ACTH (total dose, 3.5 units) did not have a survival time or mortality rate which differed appreciably from those of control animals. The altitude-adapted group had a low mortality rate when compared to any of the other groups for the initial 6 minutes of exposure; their cumulative death rates exceeded those of the Group IV animals, however. The females seemed to have a slightly greater tolerance to hypoxic exposure than the males.

4599
Maguire, R. X.,
and K. A. Merendino
EFFECT OF AGE ON MECHANISM OF DEATH AND ABILITY TO TOLERATE ACUTE HYPOTHERMIA IN DOG. — A. M. A. Arch. Surg., 70 (3): 367-373. March 1955. DNLM

Adult and juvenile dogs were subjected to progressive hypothermia until the occurrence of death. The mechanism of death in adult dogs was consistently observed to be ventricular fibrillation at an average temperature of 20.4° C., while in juvenile dogs death was due to cardiac arrest at an average temperature of 12.6° C. No constant electrocardiographic pattern of value in the prediction of imminent fibrillation was observed. It is suggested that the differences in cardiac arrhythmias noted in the two age groups may be attributed to the differences in enzymatic activity in young and adult animals.

4600
Mallan, L.
MEN, ROCKETS AND SPACE RATS. — xiii+336 p. illus. New York: Julian Messner, Inc., 1955. DLC (TL781.M26)

A popular history of the contribution of scientists, engineers, and test pilots to achievements in rocket flight is presented in anecdotal form. Events described include the development and first flight of the Bell X-1 and X1A, pioneering work at the Long Range Proving Ground in the Development of ICBM's and earth satellites, first experiments with monkeys and mice at the Aero Medical Laboratory of the Wright Air Development Center in acceleration and weightlessness, work by Col. Stapp on human tolerance to acceleration, the beginnings of high altitude flight and the development of the anti-g suit and ejection seat, experiments in isolation, temperature effects, and explosive decompression, high-altitude Moby Dick balloon flights, and work at the Department of Space Medicine of the School of Aviation Medicine.

4601
Malméjac, J.
H. Boiteau, A. Gross, and G. Neverre
[INCREASE IN THE POTASSIUM CONTENT OF PLASMA DURING ACUTE ANOXIA: DISCUSSION OF ITS ORIGIN] Augmentation de la teneur du plasma en potassium au cours de l'anoxie aiguë: discussion sur son origine. — Comptes rendus de la Société de biologie (Paris), 149 (15-18): 1547-1549. Aug.-Sept. 1955. In French. DLC (QP1.S7, v. 149)

Anesthetized dogs exposed for 3 to 5 minutes to an atmosphere of 6-8% oxygen exhibited a rapid increase in plasma potassium to a maximum of 50-100% in 2-3 minutes, followed several minutes after return to a normal atmosphere by a decline to normal or sub-normal levels. When the liver was removed in one animal without hemodynamic alteration, the increase was seen to be gradual, and did not exceed 20-30%. Thus the elevation of potassium levels under anoxia was attributed to an initial rapid release of potassium by the liver, supplemented by a slow release by other tissues.

4602
Malméjac, J.,
H. Boiteau, and G. Neverre
[DOUBLE MECHANISM OF THE INCREASE OF PLASMA POTASSIUM INDUCED BY OXYGEN DEFICIT] Double mécanisme de l'augmentation du potassium plasmatique provoquée par le déficit en oxygène. — Comptes rendus de la Société de biologie (Paris), 149 (15-18): 1549-1552. Aug.-Sept. 1955. In French. DLC (QP1.S7, v. 149)

It is shown that the increase in plasma potassium levels occurring in dogs under anoxia is produced by a release of potassium from the liver immediately upon initiation of anoxia, followed by a more gradual release of potassium by other tissues. The release of potassium by the liver may be increased by the injection of adrenalin, but its occurrence after removal of the adrenal glands indicates the additional involvement of the sympathetic nervous system. The release of potassium by the tissues is caused by modifications in cellular permeability induced by the lowered arterial pressure occurring in anoxia.

4603
Maltzman, I.,
William M. Smith, and L. O. Brooks
SOME EFFECTS OF DIFFERENT TRAINING CONDITIONS AND MANIFEST ANXIETY UPON TARGET TRACKING. — Perceptual and Motor Skills, 5 (4): 185-191. Dec. 1955. DLC (BF311.P36, v. 5)

The amount of practice on one target, target speed during practice, and manifest anxiety level were studied in regard to their effect on the tracking of a single target and the proficiency in shifting to the tracking of a second target. The anxiety level was established for each of the 80 subjects on basis of anxiety score on the Taylor Manifest Anxiety Scale. Manifest anxiety scores had a significant inverse relationship to proficiency in tracking a single target in a long practice condition, but no significant relation to proficiency in shifting pursuit to a new target. Target speed during practice was significantly related to proficiency in shifting to a new target. The subjects receiving practice in tracking a relatively slow target shifted to pursuit of the new target more rapidly than subjects receiving practice in the pursuit of a fast target. Duration of practice was unrelated to proficiency in shifting to a new target. (Authors' summary, modified)

4604
A MAN-CARRYING CENTRIFUGE: OPPORTUNITIES FOR EXTENSIVE RESEARCH. — Lancet (London), 268 (6873): 1066-1067. May 21, 1955. DLC (R31.L3, v. 268)

A discussion is presented, including diagrams and illustrations, of the principles and operation of the man-carrying centrifuge at the Royal Air Force Institute of Aviation Medicine, Farnborough. The centrifuge is designed to simulate the centrifugal acceleration encountered by pilots when they change direction at high speeds, and to provide means for measuring the physiological reactions (pulse and respiratory rates, blood pressure, and heart and brain functions) to such accelerations. It also enables experiments to be performed concerning the effects of comparatively low accelerating forces on the ability of subjects to perform simple feats involving movement, such as putting on parachute harnesses, as well as tests to be carried out on aircraft and guided-missile instruments and components.

4605
MAN-CARRYING CENTRIFUGE: RESEARCH APPARATUS AT R.A.F. INSTITUTE OF AVIATION MEDICINE. — Engineering (London), 179 (4661): 662-665. May 27, 1955. DLC (TA1.E55, v. 179)

Essentially the same as item no. 4604, with emphasis on physiological studies.

4606
Mangold, R.,
L. Sokoloff, E. Conner, J. Kleinerman, P.-O. G. Therman, and S. S. Kety
THE EFFECTS OF SLEEP AND LACK OF SLEEP ON THE CEREBRAL CIRCULATION AND METABOLISM OF NORMAL YOUNG MEN. — Jour. Clinical Investigation, 34 (7, part 1): 1092-1100. July 1955. DLC (R11.J67, v. 34)

During natural sleep, rested subjects exhibited a statistically significant increase in cerebral blood flow, statistically significant decreases in cerebral vascular resistance and mean arterial blood pressure, and no changes in cerebral oxygen consumption, hemoglobin concentration, and arterial oxygen content. The fatigued subjects who slept were distinguished from those who were unable to sleep by significantly higher values of carbon dioxide tension and lower values of pH in arterial and cerebral venous blood even during the control period. These findings suggest some relationship between respiratory acidosis and the process of falling asleep and make less tenable those hypotheses which attribute sleep to arterial anoxemia, cerebral ischemia, or to a generalized narcosis or other depression in cerebral metabolic rate. (Authors' summary, modified)

4607
Manhold, J. H.,
and Marshall B. Jones
AUTHORITARIANISM AND DENTAL CARIES. — In: Research notes from the Aviation Psychol. Lab., p. 35-40. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 108 109.03, March 15, 1955. AD 74 676
UNCLASSIFIED

An analysis of data obtained from three samples of incoming naval aviation cadets showed that nonauthoritarians, identified by the California F Scale, Form 40-45, tended to have greater dental decay, as measured by the Bodecker DMF rating, than did authoritarians. The greater incidence of dental decay among nonauthoritarians is considered to be consistent with the pattern of physical deemphasis found in this group.

4608
Mann, C. W.
CATALOG OF TRANSLATED MATERIAL IN SPACE PERCEPTION. — Tulane Univ., New Orleans, La. (Contract N7-onr-434, T. O. 1); and Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 110 500). Joint Project Report no. 37, May 15, 1955. 42 p. AD 76 064
UNCLASSIFIED

This report is a catalog of bibliographic materials in the area of proprioceptive and vestibular function and vision which have been translated from foreign languages. The catalog lists 427 items. It is arranged in the author-alphabetical format adopted by the American Psychological Association. (Author's abstract)

4609
THE MANOEUVRABLE MAN. — Aeronautics (London), 32 (6): 40-41. July 1955.
DLC (TL501.A5512, v. 32)

The man-carrying centrifuge at the Institute of Aviation Medicine in Farnborough is described. The centrifuge is capable of attaining an acceleration of 30 g in 9 seconds, and is equipped with apparatus for recording physiological changes in the occupant.

4610
Marcotte-Boy, G.,
and J. Cheymol
[EFFECT OF MODERATE HYPOXEMIA (SIMULATED ALTITUDE OF 7000 M.) ON THE DISTRIBUTION OF ACID-SOLUBLE PHOSPHORUS IN THE BLOOD] Action de l'hypoxémie modérée (altitude fictive 7.000 m.) sur la répartition dans le sang du phosphore acido-soluble. — Bulletin de la Société de chimie biologique (Paris), 37 (2-3): 383-386. 1955. In French. DNLM

Rabbits decompressed to a simulated altitude of 7000 meters for three hours demonstrated a decrease in acid-soluble phosphorus compounds in the blood. Decreases of 47% were observed in blood adenosinediphosphate and adenosinetriphosphate, 24% in hexosephosphates; an increase of 10% was noted in blood glycerophosphate content.

4611
Marion, R.
APPARATUS FOR STUDYING THREE DIMENSIONAL MOTOR SKILL. — Perceptual and Motor Skills, 5 (1): 19-22. March 1955.
DLC (BF311.P36, v. 5)

A device for studying three-dimensional motor skills is described. It consists of tubing patterns of various shapes, to be followed with a washer without touching. Performance can be scored in terms of time per trial, contact time per trial, and percent of trial time in contact. Using percent-time-in-contact scores, the odd-even reliability for 96 subjects given 14 trials was found to be .92. This apparatus can be used to study the major motor skills learning and performance variables. (Author's summary)

4612
Marks, M. R.,
and J. E. Uhlaner
EVALUATION OF NEW ARMED FORCES VISION TESTER PLATES. — Adjutant General's Office (Army). Personnel Research Branch, Washington, D. C. PRB Technical Research Report 1092, June 1955. 34 p. (Army Project no. 2956000). AD 74 756
UNCLASSIFIED

Development is discussed of an efficient and effective mesopic test (a test given under moonlight levels of illumination) for predicting ability to see under night field conditions. The Armed Forces Vision Tester was modified to make the instrument suitable for visual testing under mesopic levels of illumination. It was found that 10 minutes of dark adaptation was sufficient for reliable testing with targets presented in the AFVT at mesopic levels. Scores on potential mesopic vision classification tests were compared with performance of soldiers on a night field-detection course. The most effective predictor of night visual performance was found to be the Mesopic Line Resolution Test. (Authors' summary, modified)

4613
Marmet, J.,
and E. Grandjean
[INVESTIGATIONS ON THE BEHAVIOR OF THE RESTING METABOLISM DURING EXTENDED COLD EXPOSURE IN THE ARCTIC] Untersuchungen über das Verhalten des Ruhestoffwechsels während langdauernder Kälteexposition in der Arktis. — Helvetica physiologica et pharmacologica acta (Basel), 13 (3): 173-177. 1955. In German, with English summary (p. 176). DNLM

The resting metabolism of four healthy subjects was studied during a 6-month expedition from Zürich (9-19° C.) to Montreal (9-19° C.) and the Arctic (1st period below 0° C., 2nd period 5-10° C.). Resting metabolism increased during the first cold Arctic period, and reached a maximum immediately after the coldest day recorded (-23° C.). After the first month in the Arctic, the metabolism returned with rising environmental temperature to the values recorded in Zürich and Montreal.

4614
Marticorena Pimentel, E.
[PROBABLE EFFECT OF HIGH ALTITUDE IN THE DETERMINATION OF THE PERSISTENCE OF THE DUCTUS ARTERIOSUS: OBSERVATIONS ON 3,000 SCHOOL CHILDREN AT ALTITUDE] Probable influencia de las grandes alturas en la determinación de la persistencia del conducto arterioso: observaciones realizadas en 3,000 escolares de altura. — Revista medica peruana (Lima), 26 (323-324): 421-430. Nov.-Dec. 1955. In Spanish.
DNLM

Four cases of patent ductus arteriosus were found in Andean natives residing between 3000-3500 meters of altitude (0.47% of the population); three cases in persons between 4000-4500 meters (1.02%), and two cases at 4500-5000 meters (1.10%). All persons were between 12 and 16 years of age. The etiological role of high altitude for this abnormality is noted with reference to (1) anoxemia caused by low barometric pressure; (2) increase in pulmonary artery pressure, and (3) hypotension of the systemic circulation.

4615
Martí-Ibanez, F. 1954
PHILOSOPHICAL PERSPECTIVES OF MOTION SICKNESS. — Internat. Record Med., 167 (12): 621-626. Dec. 1954. DLC (R11.M745, v. 167)

Following a discussion of the history and terminology of motion sickness, a hypothesis is presented stating that it is caused by changes in the spatial stability of the environment in which the human being lives. Man's position on earth is physiologically perceived through the vestibular apparatus, sight organs, and the proprioceptive system. Motion sickness occurs when there are disturbances of the vestibular function along with kinesthetic and psychological alterations. Use of dimenhydrinate in the therapy and prevention of motion sickness is noted.

4616
Martin, J.
EJECTION SEATS FOR AIRCRAFT. — U. S. Patent 2,708,083. May 10, 1955. 16 leaves.
DP

An improved ejection seat is proposed which facilitates a normal parachute descent after ejection by provision of means for the simple and efficient control of (1) the release of the drogue from the seat, (2) release of the face screen and safety harness, and (3) withdrawal of the main parachute.

4617
Masoro, E. J.,
A. I. Cohen, and S. S. Panagos
EFFECT OF COLD EXPOSURE AND FASTING ON HEPATIC ACETATE METABOLISM. — Amer. Jour. Physiol., 180 (2): 341-344. Feb. 1955.
DLC (QP1.A5, v. 180)

Liver slices prepared from control rats and from rats fasted for 24 hours at either 25° C. or 0-2° C. were incubated for 3 hours in bicarbonate buffer solution containing 10 mg.% sodium acetate-1-C^{14} at 37.5° C. The ability of these slices to convert the C^{14}-acetate to $C^{14}O_2$, C^{14}-fatty acids, and C^{14}-cholesterol was determined. Liver slices from the "fasted" and "cold-fasted" rats converted far less acetate to CO_2 than did the slices from control rats. This depression in acetate oxidation was reversed by the addition of glucose either to the incubation medium or by administration to the rat via stomach tube prior to killing. It was also demonstrated that both hepatic lipogenesis and hepatic cholesterogenesis are severely depressed in the "fasted" and "cold-fasted" rat. (Authors' summary, modified)

4618
Massion, W.
[OXYGEN INTOXICATION] Sauerstoff-Intoxikation. — Klinische Wochenschrift (Berlin), 33 (19/20): 457-459. May 15, 1955. In German. DNLM

The problem of oxygen poisoning caused by the inhalation of high concentrations of oxygen is discussed. Examples are given of four ways in which oxygen breathing may effect the body, including (1) disturbance of the respiratory balance and subsequent respiratory depression in emphysematic or narcotized patients with chronic respiratory acidosis; (2) disturbances of the CO_2 circulation in

the blood by oxygen saturation of hemoglobin; (3) direct damage to the lung epithelium, central nervous system, and cell enzymes; and (4) formation of vacuums in closed air spaces through osomotic loss of nitrogen.

4619
Matheny, B. J.
TWO SIMULATORS FOR TRAINING PILOTS AND CONTROLLERS IN AIR TRAFFIC CONTROL PROCEDURES. — Univ. of Illinois, Urbana (Contract N6ori-71 (16)); issued by Special Devices Center, Port Washington, N. Y. Technical Report no. SPECDEVCEN 71-16-15, June 20, 1955. iii+22 p.
AD 70 889 UNCLASSIFIED

Two training techniques, the paper and pencil method and the crab method of simulating air traffic control procedures, were evaluated. In the former technique, the pilot traces a continuous plot of his path on a map while receiving instruction from the controller. In the crab method, aircraft flight is simulated by the movement of link trainer crabs, which are individually controlled. A preliminary comparison of these two methods, utilizing 24 subjects, showed no differences in the training effects. The simplest method, using paper and pencil, seems adequate for teaching low frequency and omni-range procedures. The more complex method, using Link trainer crabs, permits training on radar approach procedures as well as low frequency omni systems and, therefore, is a more versatile training device. (AD abstract)

4620
MATS SIMULATORS GIVE BETTER TRAINING, SAVE $4 MILLION. — Amer. Aviation, 18 (20): 36-37. Feb. 28, 1955. DLC (TL501.A675, v. 18)

Advantages provided by the use of simulators in flight training are discussed, including reduction of actual flight time and consequent reduction in costs, training of pilots on new aircraft types before prototype models are available, availability of simulators at all times and in all weather, and opportunity for exposure to a wide variety of emergency situations.

4621
Matthes, K.,
and W. Ulmer
[CONTINUOUS REGISTRATION OF CARBON DIOXIDE CONCENTRATION IN THE EXPIRED AIR BY MEANS OF AN INFRARED-ANALYZER] Fortlaufende Registrierung des CO_2-Gehaltes der Exspirationsluft mit dem Infrarotanalysator. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 201-204. 1955. In German, with English summary (p. 204).
DLC (TL503.W5563, v. 1954)

The authors describe a modified infrared-absorption indicator suitable for continuous recording of carbon dioxide content in the exhaled air in man. Examples of different arrangements of the apparatus for application to aeromedical and clinical problems are included. (Authors' summary, modified)

4622
Matthes, M.
[INFLUENCE OF POLYCYTHEMIA ON ALTITUDE ACCLIMATIZATION] Über den Einfluss der Polyglobulie auf die Höhenanpassung. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 194-200. 1955. In German, with English summary (p. 200).
DLC (TL503.W5563, v. 1954)

Experiments were conducted to explore the role of polycythemia in altitude acclimatization. Six subjects ascended repeatedly to 7500 m. altitude in a decompression chamber without oxygen. Afterwards they received transfusions of erythrocyte sediment which raised their hemoglobin level by 15 to 20% and repeated the above series of ascents. The increase in time reserve and in ceiling values was very small and persisted when hemoglobin was reduced to normal by bloodletting. It is concluded that induced ploycythemia does not improve altitude tolerance. An increase in the erythrocyte number evoked by altitude is effective only as a part of the total adaptation process.

4623
Matthews, D. S.,
B. P. Tribedi, A. R. Roy, R. Chatterjee, and A. Ghosal
SOME EFFECTS OF HIGH-ALTITUDE CLIMBING: INVESTIGATIONS MADE ON CLIMBERS OF THE BRITISH KANGCHENJUNGA RECONNAISSANCE EXPEDITION, 1954. — Brit. Med. Jour. (London), No. 4916: 768-769. March 26, 1955.
DLC (R31.B93, no. 4916)

Assessments were made of the physiological changes which occurred at high altitudes in climbers participating in the 1954 British Kangchenjunga Reconnaissance Expedition. Some general clinical observations were made on the circulatory and respiratory responses to acclimatization, the effects of high altitude on the eyes, vision, body fluids (including blood and urinary electrolytes), behavior and mental processes, and sleeping habits.

4624
Mattson, S. B.,
and E. Carlens
LOBAR VENTILATION AND OXYGEN UPTAKE IN MAN: INFLUENCE OF BODY POSITION. — Jour. Thoracic Surgery, 30 (6): 676-682. Dec. 1955.
DLC (RD536.A7, v. 30)

Ventilation and oxygen uptake in the upper and basal lobes of the right lung were spirometrically investigated in 7 male patients. A comparative study showed an inconsiderable decrease in ventilation and an appreciable decrease in oxygen uptake in the upper lobe with a change from the supine to the erect position. It is suggested that the decreased perfusion in the upper lobe is orthostatic in origin and may give rise to increased alveolar oxygen tension. (Authors' summary, modified)

4625
Matzker, J.
[INVESTIGATION OF THE REQUIREMENTS FOR EFFECTIVE SOUND PROTECTION] Untersuchungen über Voraussetzungen für einen wirksamen Schallschutz. — Zeitschrift für Laryngologie Rhinologie Otologie (Stuttgart), 34 (5): 341-348. May 1955. In German. DNLM

An audiometric method was employed whereby a standard tone was held at a constant intensity level. Closure of the auditory canal decreased hearing acuity from 27 db. at 500 c.p.s. to 48 db. at 8000 c.p.s. Additional covering of the entire head decreased hearing acuity further by 50%. In the second half of the experiment measurements were made of the loudness with which the subject perceived a bone telephone placed at different parts of the body, while having his auditory canals closed with plugs. The elastic dampening of the sound waves in the conducting bone increased with increasing sound frequency. Bone conduction was most favorable for a tone of 500 c.p.s. Certain conclusions are made in regard to effective sound protection beyond that furnished by ear plugs.

4626
Mauch, H. A.
STATUS OF VENTILATED GARMENTS FOR HIGH SPEED AIRCRAFT. — Jour. Aviation Med., 26 (1): 56-60. Feb. 1955. DLC (RC1050.A36, v. 26)

A description of an "air-conditioned anti-exposure suit" is given including preliminary test data. The purpose of the suit is twofold: to protect the wearer against heat and cold exposure, including cold-water immersion. Conductive and convective caloric heat transfer is utilized and also the mechanism of evaporation of the wearer's perspiration is put to work in order to reduce body temperature. Further, it is planned to make the resistance of the suit to the flow of ventilating air relatively low. In order to accomplish the second effect, free flow of air within the suit is planned rather than the use of air distribution hoses.

4627
Mauch, H. A.
J. F. Hall, and F. K. Klemm
A VENTILATING SYSTEM FOR CLOTHING. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-152, April 1955. vi+44 p. (Project no. 6330). AD 62 684 PB 123936

A system developed for the ventilation of Air Force clothing including the insulated water-impermeable anti-exposure suit is characterized by: (1) low pressure demand for ventilation (7 inches water at sea level), allowing the use of the system in existing aircraft with only minor changes in the air-conditioning system; (2) high efficiency of heat exchange and uniform air distribution achieved by a large number of high velocity air jets; (3) low weight and bulk, unrestricted body motion, and simple manufacturing; and (4) ease of donning. A small lightweight blower adaptable to aircraft with or without air-conditioning systems or for use outside the aircraft has been developed for the operation of the ventilating system. Experimental results obtained with human subjects exposed to thermal environments of 90-168° F. with air humidities of 6.8-31.2 mm. Hg and with ventilating air at a temperature of 45-127° F. indicated exceptional suit performance. A tentative formula was derived from the test results to predict performance and tolerance limits in various stress situations.

4628
Maynard, E. G. D.
TIME DELAY REQUIREMENTS FOR AUTOMATIC PARACHUTE RELEASE DEVICES WHEN USED BY HUMANS IN HIGH SPEED EJECTIONS. — Inst. of Aviation Medicine, R. C. A. F., Toronto. R. C. A. F. Report no. 55/1, April 1955. AD 103 482
UNCLASSIFIED

The paper covers both the level flight ejection and the vertical dive ejection for altitudes from sea level to 20,000 feet and ejection speeds up to Mach 1.0. The height lost by the jumper between the time that the parachute rip cord is pulled and the jumper's speed is arrested by the parachute is not considered in this paper. In all calculations incompressible flow is assumed to be a 200-pound man having a free-fall terminal velocity of 115 miles per hour at sea level. The aircraft's speed, at the time the ejection takes place, is assumed to be equal to the speed of sound at the altitude concerned. The vertical dive and level flight ejections are treated as two separate problems. In each of these problems the velocity is plotted as a function of time following the ejection. The height lost is plotted as a function of time and was obtained by integrating the velocity-time curves. In the level flight ejection, the height lost is based on an ejection seat having an initial upward ejection velocity of 60 feet per second. The velocities at which a specified parachute opening shock is obtained are based on work done by Commander A. P. Webster [item no. 2230, vol. II]. These velocities are plotted on the velocity-time curves for opening shocks of 20 g and 30 g for 24-foot and 28-foot nylon parachutes. (AD abstract)

4629
Mead, R. J.,
and N. D. Diamantides
DEVELOPMENT OF A PILOT ANALOG FOR THE SINGLE-DEGREE-OF-FREEDOM-CASE. — In: Aeronautical Electronics Digest, 1955 (National Conference on Aeronautical Electronics, Dayton, Ohio, 1955), p. 200-203. DLC (TL693.A3, 1955)

The design of a linear pilot analogue is described. A substitution of the pilot analogue circuit for the pilot in the mock-up revealed a certain threshold nonlinearity of the human operator, which was later incorporated in the analogue design. Parallel tests confirmed that the pilot analogue may be regarded under certain conditions as dynamically equivalent to the human operator.

4630
Mebane, J. C.
CLINICAL NEUROPSYCHIATRY IN AVIATION MEDICINE: A SURVEY OF ONE HUNDRED MILITARY PROBLEM CASES. — Jour. Aviation Med. 26 (6): 471-478. DLC (RC1050.A36, v. 26)

This is a discussion of neuro-psychiatry from the viewpoint of the specialist dealing with flying personnel. The majority of neuroses in such patients are presented with psycho-somatic syndromes. The primary effectiveness of the neuropsychiatrist in aviation medicine is to be found in preventive application of his specialty. The importance of good interviewing technique must be stressed to newly accredited specialists in aviation

medicine; the intimate acquaintance with the problems of the fliers which it is possible for the flight surgeon to obtain cannot be duplicated in the distant office of a consultant. With the facilities at hand the competent physician, acting as a flight surgeon, should not only be able to help his most troublesome neurotic patients by using the methods mentioned earlier; but, he should be able to learn from them.

4631
Meda, A.,
E. Gaffuri, and F. Gobbato
[CIRCULATORY CHANGES INDUCED BY BREATHING PURE O_2 AT ATMOSPHERIC PRESSURE] Modificazioni circulatorie indotte dalla respirazione di O_2 puro a pressione atmosferica. — Folia cardiologica (Milano), 14 (2): 189-198. April 30, 1955. In Italian. DNLM

Using the sphygmographic method of Wezler and Boger circulatory function was tested in eight subjects breathing pure oxygen at atmospheric pressure. A decrease in cardiac output and pulse frequency was observed, and an increase in the peripheral vascular resistance. Reduced pulse frequency appears early and may possibly be explained by a reflex mechanism. The increase in peripheral resistance, which appears later, is caused by the direct action of oxygen on vascular wall musculature and indicates an increased tonus of the peripheral arterioles. During oxygen breathing an increase in the speed of propagation of the sphygmic wave in the aorta was observed which may be interpreted as an expression of increased aortic tonus. These hemodynamic changes disappear fifteen minutes after discontinuing oxygen breathing.

4632
Meda, E.
[BASAL METABOLISM OF MAN ON THE MOUNTAIN] Dispendio di base dell'uomo in montagna. — Archivio di fisiologia (Firenze), 55 (1-2): 144-151. 1955. In Italian, with English summary (p. 150) DNLM

Basal metabolism was measured in seven normal men living on a mountain (Col d'Olen, Italy, altitude of 3000 meters) for a period of 7-17 days. No differences were observed in comparison to basal metabolic determinations in the same subjects at normal barometric pressure. (Author's summary, modified)

4633
Meda, E.
[BASAL METABOLISM IN ACCLIMATIZATION TO HIGH ALTITUDE] Il dispendio di base nell'acclimatazione all'alta quota. — Bollettino della Società italiana di biologia sperimentale (Napoli), 31 (1-2): 37-38. Jan.-Feb. 1955. In Italian. DNLM

Persons living at high altitude (Col d'Olen, Italy, 3000 meters of altitude) for 7-17 days exhibited no appreciable change in oxygen consumption during acclimatization in comparison to values obtained at sea level. No change was noted in carbon dioxide elimination as calculated by the respiratory quotient. The respiratory quotient was not significantly modified (average value at sea level, 0.853; at high altitude, 0.837). A slight variation in the basal metabolism was demonstrated.

4634
MEDICAL STAFFING AND EDUCATION. — U. S. Air Force Medical Service Digest, 5 (7): 8-16. July 1954. DLC

The organizational structure and functions of the staff of the U. S. Air Force Medical Service are described. The Medical Education Program, problems of procurement and utilization of medical personnel, and the career policies of the Medical Service are also discussed.

4635
Meehan, J. P.
BODY HEAT PRODUCTION AND SURFACE TEMPERATURES IN RESPONSE TO A COLD STIMULUS. — Arctic Aeromedical Lab., Ladd Air Force Base, Alaska. Project no. 7-7951, Report no. 2, Jan. 1955. 13 p. AD 78 858 UNCLASSIFIED
Also published in: Jour. Applied Physiol., 7 (5): 537-541. March 1955. DLC QP1.J72, v. 7)

Metabolic rates and multiple skin and rectal temperatures were recorded in Eskimos and Caucasians during exposure for 1 1/2 hours to a temperature of 6-7° C. The initial metabolic rate (at 28-30° C.) was found to be similar and normal in both groups. During exposure to cold, the metabolic rate of the natives increased an average of 142% in 90 minutes, while that of the Caucasians increased only 77%. The metabolic adjustment was associated in Eskimos with vigorous shivering. The head and foot temperatures of the Eskimos, initially at a lower level, remained higher than those of Caucasians during exposure to cold; body and trunk temperatures decreased to a similar extent in both groups.

4636
Meehan, J. P.
INDIVIDUAL AND RACIAL VARIATIONS IN A VASCULAR RESPONSE TO A COLD STIMULUS. — Arctic Aeromedical Lab., Ladd Air Force Base, Alaska. Project no. 7-7953, Report no. 1, April 1955. 12 p. AD 78 859. UNCLASSIFIED

Surface finger temperatures were recorded in Caucasian, Negro, and Alaskan native subjects during hand immersion for 30 minutes in ice water. Group values for average finger temperature and lowest finger temperature during the last 25 minutes of the immersion period were highest in the Alaskan native group and lowest in the Negro group. Negro and Caucasian subjects who had suffered cold injury of at least second degree severity exhibited little or no rewarming response after immersion of the fingers. The possibility of a physiological adaptation to cold on a racial basis is suggested. A physiological basis is also presented for the observed higher percentage incidence of cold injury among Negro military personnel.

4637
Meer, H. C. van der
[APPARENT DIFFERENCES IN SPEED OF MOVEMENTS IN VARIOUS DIRECTIONS] Phänomenale Geschwindigkeitsunterschiede bei Bewegungen in verschiedenen Richtungen. — Acta psychologica (Amsterdam), 11 (4): 475-503. 1955. In German. DLC (BF1.A12, v. 11)

Experiments were conducted to determine whether there is a difference in the perceived speed of two light dots moving at the same rate in different directions. In general, horizontal movements directed toward the observer's left were perceived as faster than movements directed to the right. In the vertical dimension there were no such differences between an approaching movement and a receding one. Changes in the body position resulted in a certain lability of orientation through interference with the established system of spatial referents.

4638
Meineri, G.
[PHYSIOPATHOLOGICAL EFFECTS AND SURVIVAL OF THE RAT AFTER ACCELERATIONS ALONG THE LONGITUDINAL BODY AXIS: DESCRIPTION OF THE MOST IMPORTANT LESIONS OBSERVED FOLLOWING THESE ACCELERATIONS] Effetti fisiopatologici e sopravvivenza del ratto dopo accelerazioni secondo l'asse corporeo longitudinale: descrizione delle più importanti lesioni riscontrate in seguito a dette accelerazioni. — Rivista di medicina aeronautica (Roma), 18 (2): 322-337. April-June 1955. In Italian, with English summary (p. 335).
DLC (TL555.A1R5, v. 18)

Male albino rats were subjected to accelerations in the longitudinal axis [positive and negative accelerations] in order to determine the resistance to various combinations of g multiples and times of exposure, and of establishing the possible correlations between survival and intensity and duration of acceleration, and the importance of injuries. An inversely proportional relationship was established, not mathematically determinable, between the percentage of survival and the g multiples at the same times of exposure. No exact relationship was found between the severity of injuries in various organs and the percentage of survival. Mortality was ascribed more to neurocirculatory and respiratory factors than to anatomical injuries. Injuries to the lung were the most prominent, whereas those in the liver, kidney, spleen and intestine were not clearly demonstrated. The brain exhibited little damage after exposure to high accelerations. (Author's summary, modified)

4639
Meloni, L.
[VISION IN COLORED LIGHT AND NIGHT VISION: EXPERIMENTAL RESULTS; APPLICATION TO ILLUMINATION ON SHIPS] Visione in luce colorata e visione notturna: risultati sperimentali; applicazioni all'illuminazione sulle navi. — Annali di medicina navale e tropicale (Roma), 60 (1): 5-32. Jan.-Feb. 1955. In Italian, with English summary (p. 31-32).
DNLM

The importance of the color of light in the sudden transition from a light to a dark environment is discussed with special reference to military personnel (pilots, navigators, night guards). Emphasis is placed on the physiology and characteristics of night vision and the results are presented from a series of measurements of physiological optics in colored lights. It is noted that red and reddish-brown colored lights are best suited for ocular adaptation to night vision, although they are fatiguing for reading. Green lights are recommended for local illumination of work tables and instrument panels, and the use of violet light is not recommended.

4640
Melton, R. S.
METHODOLOGICAL STUDIES IN CONFIGURAL ANALYSIS: I. LOCATION OF PREDICTIVELY USEFUL PROFILES. II. DEVELOPMENT OF CLASSIFICATION EQUATIONS. — Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 108 110.01, Feb. 1, 1955. ii+[30 p.]
AD 73 948 UNCLASSIFIED

Methods of identifying profile combinations (Minnesota Multiphasic Personality Inventory with a 10-variable profile) which are predictive of a given criterion are outlined and applied to a sample of naval aviation cadets. Utilization is made of differences in the covariances of two criterion groups for locating such profiles, and the linear discriminant function and the generalized distance function are used to generalize to other similar profiles. The relationship of these procedures to certain sociological constructs, to the nomothetic-ideographic argument, to selection and classification procedures, and to experiments on the effects of homogeneous grouping are reviewed.

4641
Mercier, A.
[NIGHT VISION] La vision nocturne. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 170-178. London: Butterworths Scientific Publications, 1955. In French.
DLC (TL500.N6, no. 6)

The threshold of morphoscopic vision in dark-adapted subjects with normal acuity was found to have a constant average value of 0.1 candle/hm.^{2}. The threshold was increased to 0.2 cd./hm.^{2} in light-adapted subjects, and decreased to 0.056 cd./hm.^{2} after night flying on oxygen. The threshold was also decreased by night training and by administration of the hormone intermedin. Factors found to be favorable to effective dark adaptation in flying are red lighting, and absence of ultraviolet light. Observation of radar screens and fatigue stemming from prolonged accommodation were shown to decrease the effectiveness of adaptation.

4642
Merlen,
Chevat, Castet, Edouard, and Boucheau
[THE BALLISTOCARDIOGRAM IN JET PILOTS] Le ballistocardiogramme chez les pilotes d'avion à réaction. — Médecine aéronautique (Paris), 10 (1): 79-86. 1955. In French. DLC (TL555.M394, v. 10)

Preliminary work in the use of the ballistocardiograph in the examination of pilots has indicated that the amplitude of the J wave is increased after jet flight, suggesting a greater ventricular ejection and diastolic filling than is normally present. The velocity of the body at rest shows greater potential energy and kinetic cardiac force. A decrease in the ratio $\frac{JK}{IJ}$ after flight, however, indicates a lack of training in experiencing accelerative forces.

4643
Merten, R.
[24-HOUR RHYTHM OF UROCATHEPSIN AND UROPEPSIN EXCRETION] 24-Stunden Rhythmus der Urokathepsin- und Uropepsinausscheidung. — Acta medica scandinavica (Stockholm), Suppl. 307: 192-193. 1955. In German. DNLM

The urocathepsin (UK) and uropepsin (UP) excretion reaches in a sober, resting individual a maximum between 7 and 11 a.m., and a minimum in the afternoon as well as between 12 and 4 a.m. at night. The total 24-hour excretion of UK and UP corresponds to the digestive activity of the stomach. The anterior pituitary-adrenocortical axis exerts a statistically significant influence on the UK and UP excretion.

4644
Meuser, W.
[THE PARTICIPATION OF BLOOD PLASMALOGEN IN THE REACTIONS OF THE AUTONOMIC NERVOUS SYSTEM] Über die Teilnahme des Blutplasmalogens an vegetativen Reaktionen. — Acta neurovegetativa (Wien), 10 (4): 485-492. 1955. In German. DNLM

The changes of blood plasmalogen level in response to rotatory vestibular stimulation were investigated in healthy subjects of different age levels. An influence of age on the plasmalogen was seen as the resting blood plasmalogen level was lower in young subjects than in those over 65 years of age. Repeated sampling of blood in the same subjects showed the plasmalogen level to be remarkably constant over a period of time. In most subjects vestibular stress caused a change in the blood plasmalogen level. This change was observed more often in female than in male subjects, and also more often in the older male subjects than in the younger. A comparison with simultaneously registered changes in blood pressure showed that a fall of the blood plasmalogen level corresponded to an ergotropic reaction and a rise to a trophotropic reaction. Where there was no change in blood pressure there was also no change in the blood plasmalogen level. (From the author's summary)

4645
Meyer, J. S.,
and D. Denny-Brown
STUDIES OF CEREBRAL CIRCULATION IN BRAIN INJURY. I. VALIDITY OF COMBINED LOCAL CEREBRAL ELECTROPOLAROGRAPHY, THERMOMETRY AND STEADY POTENTIALS AS AN INDICATOR OF LOCAL CIRCULATORY AND FUNCTIONAL CHANGES. — Electroencephalography and Clinical Neurophysiol. (Montreal), 7 (4): 511-528. Nov. 1955. DNLM

The method of polarography was employed in combination with measurements of cortical temperature, cortical pH, electroencephalography, electrocardiograph, steady potential, respiration, blood pressure, oxygen saturation, and intracranial pressure, for the examination of the cerebral blood flow in ischemia and anoxia. The effects of changes in the composition of the inspired gas in the monkey are summarized in a table for the following breathing conditions: (1) 100% O_2 after air, (2) air after 100% O_2, (3) 7% CO_2 and O2 after air, (4) asphyxia, (5) 100% nitrogen, (6) 7% O_2+93% N_2, (7) 50% CO_2+O_2 a) after air, and b) after O_2, (8) CO_2, and (9) ether.

4646
Michael, P. L.,
EVALUATION OF PRINCIPLES APPLICABLE TO THE DESIGN OF EAR PROTECTORS AND COMMUNICATION HEADSETS FOR USE IN NOISY ENVIRONMENTS. — Publication no. 13,878. Ann Arbor: University Microfilms, 1955. iv+129 p. DLC (Microfilm AC-1, 13,878)

An acoustic filter was designed by electro-acoustical analogy to pass speech components in the low audible frequencies with a minimum of attenuation, and to provide maximum attenuation in the higher, more dangerous frequencies. A significant difference in the attenuation characteristics of a concha-seated ear protector with or without the filter was observed at frequencies below 1000 c.p.s., but not at higher frequencies. Speech frequencies were passed with significantly less attenuation by the filter. The filter type protector was observed to provide the best speech intelligibility in quiet; with a steady-state noise of about 90 db. the protector without filter provided higher articulation scores. No significant difference was observed between a calculated attenuation curve and the observed curve for a filter. It was therefore concluded that certain attenuation characteristics can be predicted in designing ear protectors.

4647
Michel, E. L.
OXYGEN-WANT WARNING SYSTEMS FOR MILITARY AIRCRAFT. — Jour. Aviation Med., 26 (3): 214-217. June 1955. DLC (RC1050.A36, v. 26)

The author discusses several warning systems which are intended to indicate conditions of oxygen want. One type is the blinker or oxygen flow indicator which will visually signal when a complete loss of the oxygen supply to the regulator and oxygen mask occurs. Another is the oxygen system pressure gauge; this gauge indicates visually the quantity of oxygen available. A device, located in the mask cavity, is described which utilizes the principle of gas analysis to detect a physiological oxygen want. This device would obtain a net resultant response to the transient gas conditions, which would bear a constant relationship to the physiologically significant O_2 tension of alveolar air. The author also mentions improvements in the oximeter which gives warning of approaching hypoxia by measuring the oxygen saturation of the hemoglobin.

4648
Michel, E. M.
WINDBLAST TESTS OF THE MB-2 HELMET. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-287, Nov. 1955. iv+10 p. (Project no. 7218-71717). AD 95 755 UNCLASSIFIED

During 1954, three phases of windblast tests were conducted on the MB-2 semi-rigid helmet. The first two series of tests were made in conjunction with the B-47 downward ejection program

sponsored by the Aircraft Laboratory. The first phase was carried out at Wright-Patterson Air Force Base by using an anthropomorphic dummy ejected downward from the observer's position. The second phase, using live subjects, was made at Eglin Air Force Base, Florida. The third test was carried out at the windblast facility of the Marquardt Aircraft Company, Van Nuys, California, using an anthropomorphic dummy seated in an ejection seat installed in front of a blast nozzle. Results of the tests have proved that the MB-2 semi-rigid helmet has windblast retention capabilities and might possibly be a satisfactory replacement for the standard P-3 helmet. (Author's abstract)

4649
Micko, H. C.
[INVESTIGATIONS OF THE ACUITY OF DEPTH PERCEPTION FOR LARGER DISTANCES] Untersuchungen der Tiefensehschärfe für grössere Entfernungen. — Zeitschrift für experimentelle und angewandte Psychologie (Göttingen), 3 (4): 530-538. 1955. In German, with English summary (p. 536-537). DNLM

The depth perception of 15 subjects was determined by the two-rod method for distances of 25, 50, 100, 150, and 200 meters. Validity of the function $y_t = a.d_t/R_2$ derived from the theory of retinal disparity was investigated. The minimum of perceptible binocular parallax was, as a rule, found to lie between three and four seconds for all distances tested. It is suggested that the angular conditions, or the extent of retinal disparity, are responsible for depth perception. The minimum perceptible depth discrimination of two objects increased correspondingly with the square of their distance from the observer. There were no effects due to practice or fatigue. There was some indication that conditions of illumination affect depth perception. (Author's summary, modified)

4650
Miles, B. E.,
and H. C. Churchill-Davidson
THE EFFECT OF HYPOTHERMIA ON THE RENAL CIRCULATION OF THE DOG. — Anesthesiology, 16 (2): 230-234. March 1955. DNLM

Glomerular filtration rate and effective renal blood flow were determined by measurement of inulin and para-aminohippurate (PAH) clearances respectively in dogs cooled to temperatures of 29° to 21.4° C. Hypothermia was observed to cause a decrease in effective renal blood flow to approximately half normal at 29° C. and to quarter normal at 24° C., an increase in renal resistance, and decreases in inulin clearance, blood pressure, pulse rate, and urine flow. PAH extraction ratios were well maintained at low temperatures.

4651
MILES M.100 STUDENT. — Flight (London), 68 (2447): 915-917. Dec. 16, 1955.
DLC (TL501.F5, v. 68)

An economical lightweight turbojet trainer has been designed and built by F. G. Miles, Ltd. The trainer features large car-type doors, center keel construction, and low seating, and is designed to be both docile and representative of operational aircraft.

4652
Miller, E. M.
SEVENTY NINE HOURS. — Air Force, 38 (5): 34-36, 39-40. May 1955. DLC (UG633.A65, v. 38)

The joint United States Air Force-Royal Canadian Air Force rescue of the crew of a B-47 which crashed in Canada is described. One crew member survived a seventy-nine hour exposure in cold weather with no survival equipment other than a test survival suit.

4653
Miller, J. W.
and E. Ludvigh
A SHORTENED PROCEDURE FOR THE TESTING OF DYNAMIC VISUAL ACUITY. — Kresge Eye Inst., Detroit, Mich. (Contract NONR-586(00)); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 8, May 25, 1955. iii+12 p. (Project no. NM 001 110 501.08). AD 66 702 UNCLASSIFIED

It has been shown previously that visual acuity deteriorates as the angular velocity of the test object, relative to the observer's eye, is increased. Up to the present, a considerable amount of time has been required to determine the dynamic visual acuity of an individual. Inasmuch as it is planned to test large groups of men in the future, it was thought advisable to inquire as to whether a shorter means of testing might be possible. The data on 200 naval aviation cadets who were tested by a procedure requiring forty-five minutes were reanalyzed on the basis of a test requiring only twelve minutes. Various aspects of the tests were examined, such as the reliability and predictability of the test, and the relationships between the variables. It was found that the shortened testing procedure will henceforth be satisfactory for the testing of dynamic visual acuity. (Authors' abstract)

4654
Miller, R. K.
STANDARDS FOR PHYSICAL FITNESS: AIR FORCE. — In: Davis, H., D. H. Eldredge, and J. R. Usher (ed.). The Testing of hearing in the Armed Services: the proceedings of the third annual meeting of the Committee on Hearing and Bio-Acoustics at the United States Naval Hospital, National Naval Medical Center, Bethesda, Maryland, 25-26 October, 1955, p. 75-76. Armed Forces-National Research Council Committee on Hearing and Bio-Acoustics, St. Louis. Report no. 5, Oct. 1955. DNLM

A brief history is presented of the development of hearing standards for flying personnel of the Air Force. Early standards resulting in a too high rate of attrition were lowered to allow a maximum hearing loss for rated flying personnel at entrance into active duty of 20 db. at 250 through 2000 c.p.s. in the better ear, 20 db. at 250 and 500 c.p.s., and 40 db. at 1000 and 2000 c.p.s. Personnel not primarily in control of aircraft are allowed a maximum hearing loss of 20 db. at 250, 500, and 1000 c.p.s., and 40 db. at 2000 c.p.s. for the better ear. The standards of acceptable hearing for airmen (enlisted personnel), are based primarily on the whispered voice test.

4655
Mills, J. N.,
and S. W. Stanbury
RHYTHMIC DIURNAL VARIATIONS IN THE BEHAVIOUR OF THE HUMAN RENAL TUBULE. — Acta medica scandinavica (Stockholm), Suppl. 307:95. 1955. In English. DNLM

Persistent diurnal variations were observed in the urinary output of hydrion, potassium, sodium, chloride, and phosphate in spite of experimentally varying the sleeping, eating, and activity routines of the subjects. There was no similar regularity in the plasma sodium or potassium concentrations, alkali reserve, pH, alveolar CO_2 tension, or creatinine excretion (although phosphate excretion usually paralleled changes in plasma phosphate concentration). It is concluded that rhythmic diurnal variations in renal function are not due to changes in renal hemodynamics; while changes in plasma phosphate concentration may be responsible for the changes in phosphate output, the variations in output of hydrion, potassium and sodium must be due to some change in the tubular handling of these ions independent of their plasma level. (Quoted in part)

4656
Miniero, R.
[NOTES ON COMET AIRPLANE ACCIDENTS] Note sugli incidenti dei velivoli Comet. — Rivista aeronautica (Roma), 31 (5): 455-474. May 1955; 31 (6): 581-596, June 1955; 31 (7): 735-756, July 1955. In Italian. DLC (TL504.R54, v. 31)

An analysis, including photographs and diagrams, is presented of the wreckage from two Comet aircraft disasters which occurred on January 10 and April 8, 1954, during flights from Rome. The aircraft may have disintegrated in the following manner: (1) violent destruction of the central part of the pressurized cabin; (2) separation of the starboard outer wing, wing center section with engine and undercarriage, and port outer wing from center section in a downward direction; and (3) separation of front fuselage at front spar attachments and rear fuselage and tail unit at rear spar attachments in a downward direction. Various estimations were made of the fatigue in the tail vanes, cabin pressurization and wings.

4657
Missenard, A. R.
[ON THE CLINICAL STUDY OF SUBJECTS IN AERIAL ACCIDENTS] A propos de l'étude clinique des sujets victimes d'accidents aériens. — Médecine aéronautique (Paris), 10 (1): 87-93. 1955. In French. DLC (TL555.M394, v. 10)

The case histories of four pilots involved in aerial accidents are presented to show the complexity of medical, neuro-psychiatric, and psychological factors entering into the accidents. It is concluded from study of these cases that surveillance of personnel is necessary after sickness and in the tropics, and that training must not be interrupted unless necessary.

4658
Mitchell, R. T.,
and L. H. Liaudansky
EFFECT OF DIFFERENTIAL ADAPTATION OF THE EYES UPON THRESHOLD SENSITIVITY. — Jour. Optical Soc. Amer., 45 (10): 831-834. Oct. 1955. DLC (QC350.Q6, v. 45)

Experimental determination was made of the effect of intense light adaptation (6.20 log Trolands) of one eye upon the dark-adapted threshold of the other eye. A psycho-physical method derived from Békésy and analogous to the "up and down" method of Dixon and Mood was used. Three subjects showed a slight increase in sensitivity; one showed no change. The change was not statistically significant for the group. The finding is consistent with the accepted view that the states of adaptation of the eyes are independent and in contradiction to studies which have found an averaging effect. (Authors' abstract)

4659
Mitts, M. G.,
E. H. Sharp, L. E. Rennie, and E. C. Hoff
TOLERANCE OF RATS TO DECOMPRESSION FOLLOWING ADMINISTRATION OF ETHYL ALCOHOL. — Quart. Jour. Studies Alcohol, 16 (2): 221-233. June 1955. DLC (RC367.A35, v. 16)

Oral administration of ethyl alcohol (7 g. per kg. of body weight) to albino rats one hour before simulated ascent did not affect the survival time at pressure levels of 200, 170, and 150 mm. Hg. Female rats were more tolerant to decompression hypoxia than were males as revealed by statistical analysis. It is concluded that an intoxicating dose of alcohol in rats does not summate with severe anoxic anoxia to hasten terminal functional breakdown of the neurones governing respiration. Alcohol did not enhance tolerance to hypoxia. (From the authors' discussion and conclusions)

4660
Moeller, G.,
G. Fooks, H. G. Sperling, D. Farnsworth, and H. W. Wendt
DARK ADAPTATION AND THE NEAR ULTRAVIOLET. — Connecticut Coll., New London (Contract Nonr-1276(00)); and Naval Medical Research Lab., New London, Conn. Report no. 268 (vol. 14, no. 8), Oct. 12, 1955. iii+12 p. (Project Report no. NM 002 014.09.05). AD 84 646 UNCLASSIFIED

Two studies are reported of the effects of exposure to the near ultraviolet (principally 334, 365 and 366 mμ) upon subsequent dark adaptation. For the first study, a modified Hecht-Shlaer adaptometer was used. Four conditions of light adaptation were employed: exposure for 10 minutes to a 3.6 mL field to which ultraviolet (mercury arc lamp) or control (incandescent lamp) radiation were added, or exposure for 10 minutes to 288 mL field to which either the ultraviolet or control components were added. Performance under either of the ultraviolet conditions did not differ from that under corresponding control conditions. Brightness of the light adaptation field did not affect subsequent dark adaptation. Exposure to higher brightness delayed the onset of rod adaptation, and raised the threshold at 25-30 minutes by 0.12 log units. The second experiment was designed to determine whether or not the negative findings of the first study were due to equation of the light adaptation fields in color and brightness and the relatively low brightness of those fields. There was no reliable evidence that exposure to the near ultraviolet affects subsequent dark adaptation deleteriously. (From the authors' abstract)

4661
Moltz, H.,
and D. L. Thistlethwaite
ATTITUDE MODIFICATION AND ANXIETY REDUCTION. — Jour. Abnormal and Social Psychol., 50 (2): 231-237. March 1955.
DLC (RC321.J7, v. 50)

An experiment was conducted with approximately 500 newly inducted Air Force basic trainees to determine the effects of anxiety arousal and anxiety reduction on reported conformity to recommendations contained in a recorded communication, and on the learning of the substance of recommendations. It was hypothesized that greater anxiety reduction would be associated with significantly better learning and significantly more conformity to the dental hygiene practices specified. The communication materials intended to be differentially fear arousing were not effective in producing differences in anxiety arousal. Explicit assurance as to the efficacy of the recommended procedures was effective in producing anxiety reduction. Greater anxiety reduction was not associated with greater learning nor was it associated with greater reported conformity to the recommendations. (Authors' summary, modified)

4662
Monge, C., C.,
A. Cazorla T., G. Whittembury M., Y. Sakata B., and C. Rizo-Patron
A DESCRIPTION OF THE CIRCULATORY DYNAMICS IN THE HEART AND LUNGS OF PEOPLE AT SEA LEVEL AND AT HIGH ALTITUDE BY MEANS OF THE DYE DILUTION TECHNIQUE. —— Acta physiologica latinoamericana (Buenos Aires), 5 (4): 198-210. 1955. In English. DLC (QP1.A25, v. 5)

The circulatory dynamics of the heart and lungs of subjects living at high altitude (14,900 ft.) or at sea level were determined by the dye dilution technique. Values for circulation time, cardiac output, intrathoracic blood volume (calculated by Hamilton's formula), lung blood volume, and lung blood volume compared with total blood volume were increased slightly in 10 male Peruvian natives living at high altitude over values obtained from 20 male and 20 female subjects living at sea level.

4663
Monge M., C.
[THE CONCEPT OF ACCLIMATIZATION] El concepto de aclimatacion. —— Anales de la Facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Peru), 38 (1): 1-8. 1955. In Spanish. DNLM

A brief review is presented of the concept of acclimatization to high altitudes with reference to congenital and acquired acclimatization. It is noted that when congenital or acquired acclimatization is lost, chronic mountain sickness follows which may be cured by descent or lower altitudes or to sea level. The two types of mountain sickness are: (1) a type permitting man to live and reproduce, eventually leading to acclimatization (racial acclimatization), and (2) a type whereby man lives normally but cannot reproduce (individual acclimatization). This latter type is exceptional and can be cured by descent to lower altitudes or to sea level.

4664
Monier, M. M.,
and S. Byer
THE EFFECT OF STRESS ON THE METABOLISM OF ASCORBIC ACID: EFFECT OF INJECTION OF ACTH, THYROID EXTRACT, AND SOMATOTROPHIC HORMONE ON URINARY EXCRETION OF ASCORBIC, DEHYDROASCORBIC, AND DIKETOGULONIC ACIDS BY RATS. —— George Washington Univ., Washington, D. C.; issued by School of Aviation Medicine, Randolph Field, Tex. Aug. 1955. 4 p. AD 94 785 UNCLASSIFIED

Rats injected daily for 1-2 weeks with 1 mg. of ACTH, 5.2 mg. of thyroid extract, or 2 mg. of somatotrophic hormone, excreted no more ascorbic acid, dehydroascorbic acid, or diketogulonic acid than the same animals injected with 1 ml. of physiological saline. The injection of saline in itself is a severe stress and may be masking an effect by one or more of the test hormones. (Authors' summary, modified)

4665
Montagard, F.,
J. Siau, and Simonel
[RAPID DEVELOPMENT OF A TUBERCULAR CAVITY IN THE PLACE OF APICAL CALCIFICATION: CONSIDERATIONS ON THE APTITUDE OF FLYING PERSONNEL] Evolution rapide de tuberculose excavée à la place de calcifications apicales: considérations sur l'aptitude au personnel navigant. —— Médecine aéronautique (Paris), 10 (4): 415-418; discussion, p. 419. 1955. In French. DLC (TL555.M394, v. 10)

The appearance of cavities in place of a calcified area of the lung apex in a pilot is described. The occurrence is attributed to the effect of flight in a jet aircraft. The discovery of such a phenomenon in an early stage of development is considered essential, and may be accomplished by periodic X-ray examination. A brief discussion follows the paper.

4666
Montandon, A.,
M. Monnier, and A. Russbach
A NEW TECHNIQUE OF VESTIBULAR ROTATORY STIMULATION AND OF ELECTRICAL RECORDING OF NYSTAGMUS IN MAN. —— Annals Otol. Rhinol. and Laryngol., 64 (3): 701-717. Sept. 1955. DLC (RF1.A6, v. 64)

A method is described of liminal stimulation of the vestibular receptors allowing measurement of the threshold of ocular nystagmus by means of electronystagmography. This method permits the objective determination of an average threshold of ocular nystagmus to an acceleratory and deceleratory rotatory stimulation of the vestibular receptors (cupula ampullaris). The average threshold amounts to $0.8°/sec^2$.; no nystagmic response is observed below $0.5°/sec^2$. By means of electronystagmography, this procedure records the comparison of the normal and pathological threshold of the nystagmic reactions in all disorders of vestibular function. (44 references)

4667
Moore, W. S.,
S. H. Neel, and L. A. Crosby
THE MEDICAL ASPECTS OF ARMY AVIATION. —— Jour. Aviation Med., 26 (4): 304-307. Aug. 1955. DLC (RC1050.A36, v. 26)

This is a general discussion of the problems associated with the tactical and logistical missions of the U. S. Army aviation service with special emphasis placed upon the medical aspects of the aviation service. Medical officers for the army aviation medical service are trained at the School of Aviation Medicine at Fort Sam Houston, Texas. After further orientation, these officers are classified as Army Aviation Medical officers; and they are assigned to any army unit where 30 or more pilots exist. Evacuation of wounded by helicopter from forward battle areas was proved feasible during the Korean campaign, and the authors stress the even more important role of air evacuation in the future. The Medical Service must maintain control over such evacuation procedures from front line to rear area in order to assure rapid, unbroken transport for the wounded and sick.

4668
Morales Novoa, J.
[MEDICAL INVESTIGATION OF THE MUNICIPALITY OF BUENAVISTA DE CUELLAR, STATE OF GUERRERO: BRIEF STUDY ON MOUNTAIN SICKNESS] Exploración sanitaria del municipio de

Buenavista de Cuéllar, Estado de Guerrero: breve estudio sobre el mal de montaña. — (Thesis, Universidad Nacional Autónoma de Mexico. Facultad de Medicina). 41 p. 1955. In Spanish. DNLM (W4.M61)

An investigation is presented of nutrition, hygiene, living conditions, communicable diseases, and demography at Buenavista de Cuellar, Mexico (1,265 meters altitude). Included is a brief discussion on mountain sickness with special emphasis on its etiology, clinical manifestations, physical changes at high altitude, body fluid requirements, diagnosis, prognosis, prevention, and therapy.

4669
Moran, J. P.
APPARATUS FOR RELEASING AN AVIATOR FROM A SAFETY HARNESS CONNECTION WITH A SEAT. — U. S. Patent 2,763,451. Sept. 18, 1956. 6 leaves. DP

An apparatus has been designed for the automatic or manual release of an aircraft crew member from the harness which secures him to his seat during ejection.

4670
Morant, G. M.
BODY MEASUREMENTS IN RELATION TO WORK SPACES IN AIRCRAFT. — In: North Atlantic Treaty Organization, Anthropometry and human engineering, p. 3-17. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 5)

The use by the Royal Air Force of knowledge of body measurements in the design of aircraft spaces suitable to a diversity of physical types is discussed. The procedure for the application of body measurements to the design of aircraft includes: (1) reference to suitable anthropometric data for the community of operators, (2) establishment of minimal operational standards, and (3) trials in a mock adjustable cockpit with representative measured subjects. A minimal number of body measurements (stature, sitting height, arm length, thigh length, leg length, seat breadth) has been found to provide information sufficient for most design purposes. Among broadly uniform racial types (i.e., European) satisfactory community estimations of these body dimensions may be made from measurements of stature alone. Dimensional limitations found to be essential in R.A.F. pilots are height (64 to 75 inches) and thigh length for certain fighter aircraft (for ejection clearance).

4671
Morin, R. E.
FACTORS INFLUENCING RATE AND EXTENT OF LEARNING IN THE PRESENCE OF MISINFORMATIVE FEEDBACK. — Jour. Exper. Psychol., 49 (5): 343-351. May 1955. DLC (BF1.J6, v. 49)

When subjects were aware of misinformative feedback they learned significantly faster and more went to the optimal solution. Use of an unexplained correction signal near the end of misinformative trials significantly improved performance. A further significant improvement was obtained when the correction signal was explained. In general the difficulty of learning optimal behavior increased as the percentage of misinformative feedback increased. Awareness of possible misinformative feedback also increased persistence in incorrect modes of response. Most individuals and groups were not showing probability matching behavior at the termination of practice, either because practice had not been carried far enough, or because they had surpassed a probability matching solution, or they had reached a stable state below the matching level. (Author's summary, modified)

4672
Morin, R. E.,
and D. A. Grant
LEARNING AND PERFORMANCE ON A KEY-PRESSING TASK AS A FUNCTION OF THE DEGREE OF SPATIAL STIMULUS-RESPONSE CORRESPONDENCE. — Jour. Exper. Psychol., 49 (1): 39-47. Jan. 1955. DLC (BF1.J6, v. 49)

Same as item no. 1849, vol. II.

4673
Morris, G. C.,
J. H. Moyer, D. A. Cooley, and H. L. Brockman
THE RENAL HEMODYNAMIC RESPONSE TO HYPOTHERMIA AND TO CLAMPING OF THE THORACIC AORTA WITH AND WITHOUT HYPOTHERMIA. — Surgical Forum, 5 (Proc. Forum Sessions, Clinical Congress of the Amer. Coll. of Surgeons, 40th (Atlantic City, N. J., 1954)), p. 219-224. DNLM (W1.AM338)

Hypothermia in dogs at a temperature level of 26°-28° C. promoted moderate hypotension, and severe depression in renal blood flow and glomerular filtration rate. Renal function did not recover completely during the first few hours after rewarming but reached normal values within 24 hours. Urine flow was not depressed in the cooled state and reflected diminished tubular reabsorption. (From the authors' summary)

4674
Moseley, H. G.
INJURIES INCURRED IN AIRCRAFT ACCIDENTS. — Military Med., 116 (6): 440-445. June 1955. DLC (RD1.A7, v. 116)

An analysis of the injuries incurred in U. S. Air Force aircraft accidents during January 1, 1951 to December 31, 1953, revealed that the most frequent major non-fatal injuries were: fractures of the extremities, vertebral fractures, skull fractures and concussion, surface wounds, and burns. Very few internal injuries were noted, and cases of hemorrhage and shock were seldom reported. The majority of fatal injuries resulted from accidents wherein there was disintegration of the aircraft. However, a significant number occurred as a result of failure to use protective equipment or because of inadequate protective equipment. The development of more adequate protective equipment and the wider use of available equipment to reduce the number of injuries are discussed. (Author's summary, modified)

4675
Moseley, H. G.
WHO'S YOUR DOCTOR? — Flying Safety, 11 (1): 26-28. Jan. 1955. DLC (UG633.F43, v. 11)

Two flight accidents due to impaired health of the pilots are described to illustrate the dangers of self-treatment and neglect to consult the flight surgeon at the first appearance of symptoms.

4676
Moser, H. M.,
J. J. Dreher, and S. Adler
A COMPARISON OF HYPONASALITY, HYPERNASALITY, AND NORMAL VOICE QUALITY ON THE INTELLIGIBILITY OF TWO-DIGIT NUMBERS. — Ohio State Univ. Research Foundation, Columbus. (Contract AF18(600)316). Technical Report no. 25, July 1955. iii+5 p. AD 76 381 UNCLASSIFIED

The intelligibility of a series of two-digit numbers recorded by Eastern and General American speakers with hyponasal, hypernasal, and normal voice qualities was determined at two sound-to-noise ratios (-12 and -15 db.). Normal transmission was observed to be significantly superior to the hyponasal and hypernasal forms of presentation at the more favorable sound-to-noise ratio. At the -15 db. ratio normal transmission was slightly more efficient than the hyponasal method, and significantly superior to the hypernasal method.

4677
Moser, W. P.
[TRACE-ANALYTICAL INQUEST METHODS IN FLIGHT ACCIDENTS] Spurenanalytische Untersuchungsmethoden bei Flugunfällen. — Zeitschrift für Flugwissenschaften (Braunschweig), 3 (1): 19-21. Jan. 1955. In German, with English summary (p. 19). DLC (TL503.W557, v. 3)

Microchemical trace analysis offers clues which aid in accurate reconstruction of flight accidents and of the events that led up to them. Suggestions are given as to which aircraft parts, equipment, clothing, and body parts are likely to yield evidence. Procedures of recovery and preservation of fragments for later analysis are described. Examples of analyses of causal factors in three aircraft accidents are included.

4678
Moss, W. W.
PILOT TRAINING PROGRAM. — Skyways, 14 (5): 12-13, 27, 42-43. May 1955. DLC (TL501.S634, v. 14)

Scheduling of the periodic training program for Pan American World Airways pilots at intervals during the entire year provides balance between training and checks, encourages year-round competency, and provides schedule flexibility. The program consists of (1) a periodic technique check (required by law) in which performance in routine and emergency (engine loss, feathering, fire) situations is tested; (2) training on a Link trainer, personal tutoring on airways procedure, and a final DC-3 training flight; (3) a ground school refresher course covering systems and designs, emergency equipment, evacuation, cruise control, and performance; and (4) a periodic instruction ride on the pilot's aircraft type.

4679
Mote, F. A.,
and E. R. Adair
DARK ADAPTATION AFTER INTERMITTENT AND CONTINUOUS PRE-EXPOSURES OF EQUAL DURATION. — Jour. Exper. Psychol., 49 (3): 215-219. March 1955. DLC (BF1.J6, v. 49)

Dark adaptation after continuous pre-exposures of 2, 4, 6, 8, 12, 16, 24, and 48 min. were measured for two subjects and the results compared with dark-adaptation measurements after intermittent pre-exposures of the same duration. The rate of intermittence was 1 cycle/sec. and the ratios of light to dark in the cycle were 1/2-1/2, 1/4-3/4, 1/8-7/8, and 1/16-15/16. The intensities were 140, 281, and 652 mL. The total quantity of pre-exposure light for the continuous condition was always greater than for the intermittent condition of the same intensity and duration with which it was compared. For the shorter durations, up to about 6 min., the curves of dark adaptation after both conditions of pre-exposure were similar. For longer durations it was found that after intermittent pre-exposure dark adaptation proceeded rapidly for about 5 min. and then slowed down. The retardation was so pronounced that the time required to reach the final dark-adapted threshold level was nearly always as long as, and sometimes longer than, the time required after continuous pre-exposure, despite the fact that in some instances the quantity of pre-exposure light for the continuous condition was 16 times greater than for the intermittent. (Authors' summary)

4680
Mote, F. A.
VARIABILITY OF MEASUREMENTS OF HUMAN DARK ADAPTATION. — Jour. Optical Soc. Amer., 45 (1): 7-12. Jan. 1955. DLC (QC350.Q6, v. 45)

Dark adaptation was measured in three subjects under the same pre-exposure and testing conditions during 12 sessions spread over a period of 11 months. The variability of threshold measurements changed during the course of 40 minutes of dark adaptation. Beginning at a given value, the thresholds declined in magnitude toward the end of cone adaptation, showed increase markedly in two of the subjects at the time of the cone-rod transition, remained at a relatively high level for several minutes, and then declined to a minimum stable value by 20 minutes. The magnitude of the variability changed inconsistently in the course of the experiment. No ready explanation for the occurrence of aberrant curves is available.

4681
Mouden, L. H.
ALPA AIR SAFETY FORUM. — Skyways, 14 (5): 11, 26. May 1955. DLC (TL501.S634, v. 14)

A report of the 3rd Annual Air Safety Forum sponsored by the Air Line Pilots Association is presented. Subjects considered by the Forum were the ALPA's safety organization, visual aids for airport qualification, pilot training and all-weather flying, accident investigation and prevention, survival design, and turbo-propeller transport operations.

4682
Moulierac, L.,
J. Sais, and M. Gerardin
[ACCIDENT FROM EXPOSURE TO THE EXHAUST OF A TURBO-JET] Accident par exposition au souffle issu d'un turbo-réacteur. — Médecine aéronautique (Paris), 10 (2): 171-174. 1955. In French. DLC (TL555.M394, v. 10)

The case history of a victim of an accident involving exposure to the exhaust of a turbo-jet is presented. The victim suffered burns and irritation of the eyes from exposure to hot gases, and traumatic lesions, chiefly fractures, from the turbulence of the air flow.

4683
Müller, B.
[CLINICAL AND PHYSIOLOGICAL CONSIDERATIONS OF ALTITUDE TOLERANCE OF FLIERS

UNDER SULFONAMIDE CHEMOTHERAPY] Klinisch-physiologische Betrachtungen zur Höhenfestigkeit von Fliegern bei der Chemotherapie mit Sulfonamiden. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 209-212. 1955. In German, with English summary (p. 212). DLC (TL503.W5563, v. 1954)

Experiments investigating the effects of sulfonamide therapy on altitude tolerance gave no clear-cut evidence that sulfonamides in the dosages used adversely affected altitude resistance. Reports to the contrary are generally of fliers treated for infectious diseases with fever, where the decline in altitude tolerance is possibly due to the additive effects of fever-heightened oxidative processes and lowered atmospheric oxygen partial pressure.

4684
Müller, E.
[THE PATHOLOGY OF THE GENERAL HYPOTHERMIA IN MAN] Die Pathologie der allgemeinen Unterkühlung des Menschen. — Acta neurovegetativa (Wien), 11 (1-4): 146-168. 1955. In German. DNLM

This report is based on an investigation of deaths due to exposure to cold as a result of naval accidents. Morphological changes found in various systems are described. The exact cause of death in hypothermia cannot be determined from the morphological point of view alone. No distinct tissue changes were seen which could be considered as the cause of death. Hypoxia, failure of the enzyme systems, and blocking of the conduction of cardiac stimulation are discussed as possible causes of death in hypothermia.

4685
Münchinger, R.,
and E. Grandjean
[OXYGEN BREATHING AND WORK CAPACITY] Sauerstoffatmung und Leistungsfähigkeit. — Schweizerische Zeitschrift für Sportmedizin (Genève), 3: 43-63. 1955. In German, with English summary (p. 61). DNLM

The influence of oxygen breathing on circulatory rate, ventilation, and functional capacity was studied by means of a treadmill, the bicycle ergometer, swimming, and other tests. O_2-breathing diminishes the heart rate only a little at rest and during light work; administered before heavier work it delays the increase of the heart frequency. In the recovery period oxygen accelerated the recuperation. O_2-breathing during exhausting work allows a visible increase of the performance without overloading the circulation and respiration and without any further drawing upon the reserves. (Authors' summary)

4686
Muller, P. F.
EFFICIENCY OF VERBAL VERSUS MOTOR RESPONSES IN HANDLING INFORMATION ENCODED BY MEANS OF COLORS AND LIGHT PATTERNS. — Ohio State Univ. Lab. of Aviation Psychology and Ohio State Univ. Research Foundation, Columbus (Contract AF 33(616)-43); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-472, Dec. 1955. v+15 p. (Project no. 5-(7-7192). AD 107 260 PB 121520

The present experiment reports data on information handling rates from eight groups of subjects, four experimental and four control, that worked with spatial and color symbols, and made verbal (number) and motor (key pressing) responses. The major findings were as follows: (a) Performance with ten lights as symbols was greatly superior to performance with ten color symbols. (b) With color symbols verbal and motor responses were comparable. (c) With spatial symbols motor responses were superior to verbal (number naming) responses. (d) Transfer from verbal to motor responses was easier than transfer from motor to verbal responses. These results are discussed in relation to the general concept of stimulus-response (S-R) compatibility. It is hypothesized that (1) the superiority of motor over verbal responses may be only another instance of specific S-R compatibility effects rather than any general superiority of one over the other response mode; (2) transfer effects are related to the degree of symbolic (verbal) and information transformation processes intervening between stimulus and response; and (3) unequal transfer effects may also result from prior experience on compatible versus S-R combinations (less interference may result in going from an incompatible situation). (Author's summary)

4687
Mumenthaler, M.
[REASONS FOR PREMATURE RETIREMENT FROM FLIGHT SERVICE FOR A GROUP OF MILITARY PILOTS IN THE SWISS ARMY] Gründe für die vorzeitige Einstellung im Flugdienst bei einer Gruppe von Militärpiloten der Schweiz. Armee. — Vierteljahrsschrift für schweizerische Sanitätsoffiziere (Basel), 32 (1): 12-22. Feb. 1955. In German. DNLM

The causes for premature retirement of military pilots in the Swiss Army were examined for a definite time span. Expressed in percentages, 19.5% of these men were retired because of somatic-medical reasons, 47.2% because of purely psychological reasons on the basis of medical decisions, 2.3% because of both psychological and physical reasons, and 31.0% upon their own request. The distribution of retirements over the years of flight service showed a relative accrual of premature retirements around the first, seventh, and twelfth year of flight service, with a maximum in the seventh year. A survey of the relation between premature retirement and age of the pilot shows a definite maximum of retirements around the 33rd year. The influence of aging is considered within the socio-economic context of Switzerland as it affects the pilot's motivation for flight often leading to a voluntary request for premature retirement.

4688
Mumenthaler, M.
[EFFECT OF HYPOXIA ON THE RESULT OF THE RORSCHACH TEST] Influence de l'hypoxie sur le résultat du test de Rorschach. — Médecine aéronautique (Paris), 10 (1): 31-36. 1955. In French. DLC (TL555.M394, v. 10)

Forty-seven student pilots subjected to a Rorschach test 19 months earlier under normal conditions were tested under conditions of hypoxia produced in a decompression chamber at a simulated altitude of 6000 m. The frequency of emotionally

indicative responses appearing normally was found to be increased under hypoxia from 60 to 150 instances. These were responses in which predominated (1) the universe, sea, earth, and elements; (2) primitive states of development of the individual, ancient history, and myths; (3) an emphasis on external and material qualities, such as rigidity; (4) elements of rotation and the dance; (5) heaviness, including fatigue; (6) grotesque elements; and (7) vague and uncertain identifications. Two or more of these qualities were often combined in one response. Responses tended to emphasize detail and stationary position. The fundamental intellectual functions of the subjects, indicated by factors such as reaction time and percentage of animals, were not impaired by lack of oxygen. The differences noted between responses in the normal and hypoxic states, which manifested in the latter a sense of detachment from reality, were considered to be indicative of a general psychic reaction which is not peculiar to hypoxia.

4689
Murnin, J. A.
COMPARISON OF TRAINING MEDIA: TRANSFER OF PRINCIPLES INVOLVED IN A MANIPULATIVE SKILL; OPERATION OF THE AIRCRAFT LOAD ADJUSTER SLIDE RULE. — Pennsylvania State Univ., University Park (Contract N6onr-269); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 269-7-103, Sept. 20, 1955. 36 p. (SPECDEVCEN Project 20-E-4). AD 81 663 UNCLASSIFIED

The purpose of this study was to determine the teaching effectiveness of a training device designed to facilitate transfer of basic principles from one performance skill to a similar performance skill. The tests consisted in the application of weight-and-balance principles from one aircraft type to another as these principles were applied in the operation of a slide rule system. Specific questions were raised: (1) Is the Multi-Engine Weight-and-Balance Trainer more effective than the individual load adjuster slide rule itself for teaching transfer of the principles of weight-and-balance to other aircraft? There is no evidence that this is true. (2) Are transparencies of the aircraft models as effective as the Multi-Engine Weight-and-Balance Trainer in teaching transfer of weight and balance principles to other aircraft? There is evidence that transparencies are not as effective as the Trainer. (From the author's conclusions)

4690
Murphy, C. W.,
E. Kurlents, R. A. Cleghorn, and D. O. Hebb
ABSENCE OF INCREASED CORTICOID EXCRETION WITH THE STRESS OF PERCEPTUAL DEPRIVATION. — Canad. Jour. Biochem. and Physiol. (Ottawa), 33 (6): 1062-1063. Nov. 1955. DLC (R11.C37, v. 33)

No increase in urinary corticoid excretion was observed in persons subjected to long periods of perceptual deprivation in an air-conditioned cubicle. It appears that under these circumstances the adrenal cortex is not activated to a greater degree than it is by the minor exigencies of every day life.

4691
Näätänen, E. K.,
and V. K. Hopsu
EFFECT OF PSYCHIC STRESS ON THE LIVER OF RATS. — Suomalaisen tiedeakatemian toimituksia (Annales Academiae scientiarum fennicae) (Helsinki), Series A, V (Medica-anthropologica), no. 55. 1955. 13 p. In English. DNLM

Microscopic examination of the livers of rats exposed for 2 to 6 weeks to psychic stress produced by brilliant flashes of light and loud noises showed marked infiltration of fat in the initial stages of the experiment, simultaneous atrophy and hypertrophy of cells and nuclei, degeneration of the columnar structure, necrosis, leucocyte infiltration, and distension of the central veins. The effect of stress on the liver was apparently greater in female rats, in rats given a daily administration of ACTH, and in rats on a salt-free diet.

4692
Nahas, G. G.,
M. B. Visscher, G. W. Mather, F. J. Haddy, and H. R. Warner
PULMONARY EFFECTS OF RAPID CHANGES IN OXYGEN TENSION. A. INFLUENCE OF HYPOXIA ON THE PULMONARY CIRCULATION OF NONNARCOTIZED DOGS. — Univ. of Minnesota, Minneapolis; issued by School of Aviation Medicine, Randolph Field, Tex. Jan. 1955. 12 p. (Project no. 21-1204-0001, Report no. 4). AD 102 690 UNCLASSIFIED

Methods are described for measuring intracardiac pressures and "cardiac output" in the normal, trained, nonnarcotized dog breathing 8 percent oxygen in nitrogen (hypoxia). Under such experimental conditions, the following respiratory and circulatory changes were observed: (1) an increase in integrated mean pulmonary artery pressure; (2) no significant change in left atrial pressure; (3) a trend toward an increase in heart rate; (4) an increase in cardiac output measured 5 minutes after hypoxia by the dye dilution method and by the pulse contour method; and (5) a lowered oxygen uptake measured 5 minutes after onset of hypoxia over a 5-minute period. (Authors' abstract)

4693
Nahas, G. G.,
G. W. Mather, J. D. M. Wargo, and W. L. Adams
PULMONARY EFFECTS OF RAPID CHANGES IN OXYGEN TENSION. B. INFLUENCE OF ACUTE HYPOXIA ON THE PULMONARY CIRCULATION OF SYMPATHECTOMIZED AND ADRENALECTOMIZED DOGS. — Univ. of Minnesota, Minneaoplis; issued by School of Aviation Medicine, Randolph Field, Tex. Jan. 1955. 3 p. (Project no. 21-1204-0001, Report no. 5). AD 102 690 UNCLASSIFIED

In 5 sympathectomized, nonnarcotized dogs exposed to 8 percent oxygen in nitrogen, the changes in heart rate and cardiac output were of smaller magnitude than those observed on intact animals. In 5 adrenalectomized dogs studied under the same conditions these changes were not present. (Authors' conclusion)

4694
[THE SOCIETY'S CENTRIFUGE INSTALLATION IN THE KAROLINSKA INSTITUTE HAS BEEN COM-

PLETED] Nämndens centrifuganläggning vid Karolinska institutet färdigställd. — Meddelanden från flyg- och navalmedicinska nämden (Stockholm), 4 (4): 1-4. 1955. In Swedish, with English summary (p. 4). DNLM

The human centrifuge installed at the aeromedical laboratory of the Karolinska Institute is designed to measure experimentally the physiological reactions to centrifugal acceleration simulating that encountered in high-performance aircraft. The significance of research in acceleration physiology has increased in recent years with the rapid development of higher speeds and improved maneuverability of aircraft. Psychoneurological problems pertaining to characteristics of the man-machine systems have gained in importance although many circulatory problems still remain unsolved. The importance of basic research in this area is stressed. Some comments are made on the nature of research and problems of experimental techniques associated with the human centrifuge. (From the author's summary)

4695
[Naval Dental School, Bethesda, Md.]
AVIATION DENTISTRY. — In: Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 221-243. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

The dental problems related to aviation and the existing medical-dental problems affecting flying personnel are presented with emphasis on the following topics; (1) aerodontalgia (etiology, case history classification, diagnosis, differential daagnosis, activating factors); (2) periodontal diseases (incidence, etiology, dental pressure habits, Vincent's stomatitis); (3) relation of aerodontalgia to aerosinusitis; (4) outline of diagnostic procedure; (5) control of dental diseases produced by high altitudes; (6) observations by dental officers at 200 Army Air Force installations as related to oral infections and hygiene; (7) the importance of the dental record, standard form 603, as related to aviation, and (8) research in aviation dentistry. (62 references)

4696
Nedzel, A. J.
INFLUENCE OF NEGATIVE PRESSURE ON THE TOXICITY OF MORPHINE SULFATE IN WHITE MICE. — Jour. Aviation Med., 26 (2): 164-165. April 1955. DLC (RC1050.A36, v. 26)

Mortality at hourly intervals up to four hours was measured in white mice which received a minimal lethal dose of morphine sulfate (5 mg. per 20 gm.). Fewer deaths occurred in mice exposed to a simulated altitude of 10,000 feet, both with and without supplemental oxygen, than was observed in control mice maintained at ground level. The reduced toxicity of the morphine sulfate is probably due to the delayed rate of absorption of the drug with simulated altitude (Author's summary)

4697
Neel, S. H.
THE ADAPTABILITY RATING FOR MILITARY AERONAUTICS (ARMA). — U. S. Armed Forces Med. Jour., 6 (7): 1005-1010. July 1955. DLC (RC970.U7, v. 6)

The Adaptability Rating for Military Aeronautics (ARMA) permits an evaluation of the applicant's total personality as it relates to the specific stresses of army aviation. It provides a basis for accurately predicting the probability of an applicant's completing the training for which he has applied, and his subsequent success in operational flying. It is based on all facts obtained in the medical, psychiatric, and psychological histories; the general physical, neurological and special examinations, and various aptitude tests. Special consideration is given to the applicant's zeal for flying, his maturity, stability and drive in the face of hardship, and his aptitude for additional non-flying responsibilities. Proper rating will reduce the attrition during training and subsequent operational flying, promote economy, and improve flying safety. (Author's summary, modified)

4698
Neel, S. H.
THE ARMY AVIATION MEDICAL PROGRAM. — U. S. Armed Forces Med. Jour., 6 (9): 1341-1348. Sept. 1955. DLC (RC970.U7, v. 6)

Basically, the Army aviation medical program includes the following: (1) performance of initial, periodic and special physical examinations of flight personnel; (2) provision of clinical care for flight personnel, considering the specific problems inherent to such personnel; (3) advising the responsible commanders and boards of officers concerning the medical aspects of aviation problems; and (4) development, with other responsible agencies, of improved policies and procedures for the use of aircraft and equipment by flight personnel. Discussion is presented of Air Force aviation medicine training facilities and of the medical specialists in existing medical installations. It is proposed that aviation medical officers be authorized distinctive insignia on completion of qualifying experiences and on designation by the Surgeon General, and that they be provided with additional flight pay contingent upon the actual duties performed.

4699
Neel, S. H.
HELICOPTER EVACUATION IN KOREA. — U. S. Armed Forces Med. Jour., 6 (5): 691-702. May 1955. DLC (RC970.U7, v. 6)

The development and organization of medical helicopter services for the evacuation of casualties from difficult terrain and in combat areas in Korea are discussed. Emphasis is placed on the lessons learned and the principles developed with reference to organization, control, communications, personnel, and aircraft. The importance is mentioned of supplemental helicopter evacuation support by nonmedical aviation agencies. The superiority of the company type organization for helicopter evacuation elements is pointed out and modifications of some helicopters are suggested.

4700
Neely, J. C.
PRACTICAL ASPECTS OF HETEROPHORIA IN AVIATION. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research

and Development, Collected papers on aviation medicine, p. 195-209. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

Study of 23 cases of horizontal phoria of more than 6 prism diopters in pilots of the R.A.F. has revealed only two cases of flying difficulties due to visual inadequacy. Surgical correction of heterophoria in R.A.F. personnel has in many cases relieved symptoms of eyestrain. Piloting difficulties broadly attributed to heterophoria may often be explained by temperamental unsuitability.

4701
Neff, W. D.
NEURAL MECHANISMS OF HEARING. — In: Office of Naval Research, Symposium on physiological psychology, p. 240-258. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100
UNCLASSIFIED

Experiments on cats and monkeys investigating (a) how ablation of the auditory cortex affects the ability to utilize auditory signals to guide behavior and (b) the role of auditory cortex in discrimination of frequency and tonal patterns, are reported.

4702
Neffson, A. H.
LABYRINTHINE (VESTIBULAR) FUNCTION TESTS. I. TECHNIQUES. — Amer. Jour. Med. Sci., 229 (4): 421-443. April 1955. DLC (R11.A5, v. 229)

A review is presented of the techniques used in performing various vestibular function tests (nystagmic tests, past pointing, subjective sensation, semicircular canal function tests, rotation test, cupulometry, caloric test, fistula test, galvanic test), along with a description of the anatomy and physiology upon which these tests are based. They serve as an aid to otologic and neurologic diagnosis. (113 references)

4703
Nethercut, R. E.
HUMAN ENGINEERING SIMPLIFIES HIGH SPEED FLIGHT. — Canad. Aviation (Toronto), 28 (7): 24-25. July 1955. DLC (TL501.C33, v. 28)

The technological development of aircraft has progressed to a stage where the performance capabilities of the pilot-aircraft combination are often limited by the inherent deficiencies of the human pilot. The problem is being met by an increase in the automatic control of aircraft through integration of information displays and increasing utilization of flight director information and the automatic pilot.

4704
Neuhaus, G.
[ADAPTATION TO CHRONIC OXYGEN DEFICIENCY: PHYSIOLOGICAL FINDINGS IN MORBUS CAERULEUS] Anpassung an chronischen Sauerstoffmangel: physiologische Befunde beim Morbus caeruleus. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 213-221. 1955. In German, with English Summary (p. 221)
DLC (TL503.W5563, v. 1954)

Also published in: Internationale Zeitschrift für angewandte Physiologie (Berlin), 16 (2): 133-151. 1955. DNLM

A comparative investigation of adaptation mechanisms in chronic hypoxia was conducted with fully compensated morbus caeruleus patients and altitude-acclimatized healthy subjects. Under similar altitude conditions, equated for arterial oxygen tension, the patients exhibited superior performance and higher resistance to acute anoxia. Physiological differences were basically due to increased arterial CO_2 tension in the presence of an alveolar tension comparable to that of altitude-acclimatized subjects. Oxygen deficiency is a factor in the production of polycythemia and pseudo-vascularization. The importance of venous O_2 tension is seen in the correlatiom between effects of anoxia on the organism and the venous oxygen tension, regardless whether it is produced by primary venous or primary arterial hypoxia. These findings are discussed in relation to phylogenetic adaptation mechanisms and cellular research.

4705
New, G. W.
YOU'RE IN SPACE. — Air Training, 4 (6): 24-25. Jan. 1955. DLC (UG633.A1A52, v. 4)

A test pilot's subjective experiences in ascending to higher than 85,000 ft. altitude are described. The sensations during a brief period of weightlessness included falling, difficulty in orienting and spinning.

4706
NEW LOW-COST TRAINER: CHECKING PILOT RESPONSE IN T-33. — Canadian Aviation (Toronto), 28 (4): 120. April 1955. DLC (TL501.C33, v. 28)

A device known as the Stanley T-33A cockpit procedure trainer is being installed for evaluation at Loredo Air Force Base, Texas. The trainer provides instructor control and response monitoring through an interphone and light signal system. It requires no special housing or maintenance personnel, and its parts are largely replaceable from Air Force supply stock.

4707
THE NEW TRAINING. — Flight (London), 67 (2398): 5. Jan. 7, 1955. DLC (TL501.F5, v. 67)

Completion of the first course of training entirely in the Provost-Vampire sequence is reported. Early introduction of jet training in this course eliminated 70 hours of the flight training formerly required, and produced pilots more experienced in jet flying.

4708
Newman, E. B.
PSYCHO-PHYSICAL EFFECTS OF NOISE. — Noise Control, 1 (4): 16-21. July 1955.
DLC (TA365.N6, v. 1)

Included in a general discussion of the psychophysiological effects of noise (above 100 decibels) are those causing (1) interference with speech and organized activity; (2) fatigue and loss of efficiency;

(3) emotional problems; and (4) hearing loss. Mention is also made of the problem of ultra-high noise produced by jet engines (above 130 decibels).

4709
Niazi, S. A.,
and F. J. Lewis
RESUMPTION OF HEARTBEAT IN DOGS AFTER STANDSTILL AT LOW TEMPERATURES. — Surgical Forum, 5 (Proc. Forum Sessions, Clinical Congress of the Amer. Coll. of Surgeons, 40th (Atlantic City, N. J., 1954)), p. 113-115. 1955. DLC (RD1.A363, v. 5)

Cardiac standstill occurred in 50% of the dogs cooled to 0° to 11.5° C. in blankets through which 50% alcohol in water at -12° C. circulated in rubber tubing. 80% survived intervals of standstill lasting 1 to 1 1/4 hours. Ventricular fibrillation or continued heartbeat occurred in 20-30% of the animals, and among these the mortality was high.

4710
Nicholls, D.,
and R. J. Rossiter
EFFECT OF COLD STRESS ON THE PHOSPHORUS METABOLISM OF THE ADRENAL GLAND. — Canad. Jour. Biochem. and Physiol. (Ottawa), 33 (3): 233-247. May 1955. DLC (R11.C37, v. 33)

With short periods of cold stress (2, 3, 6, 24 hours) there was an increase in the relative specific activity of adrenal phosphorus fractions, greatest for an exposure of 2-3 hours and least for 24 hours, with no significant change in the specific activity of plasma inorganic phosphorus. With longer periods in the cold (2, 4, 8, 16 days), in addition to the usual increase in adrenal weight, there was an increase in the relative specific activity of each of the three adrenal acid-soluble phosphorus fractions. Evidence is presented for the view that this change in adrenal phosphorus metabolism can be interpreted in terms of an increase in the rate at which inorganic radiophosphorus passes across the cell membrane. It is suggested that the change after a short (2-3 hour) exposure to cold is brought about by the stimulation of the adrenal cortex by endogenous ACTH from the pituitary. The change after longer exposures may be related to thyroid function. (From the authors' abstract) (46 references)

4711
Nicolas, B.
[THE AVIATOR AND HIS DOCTOR] L'aviateur et son medécin. — L'air (Paris), 36 (703): 33-35. Sept. 1955. In French. DLC (TL502.A476, v. 36)

A brief analysis of the flight surgeon's duties indicates that he is responsible for: (1) medico-physiological examinations of flight candidates prior to selection; (2) periodic medical examinations of flight personnel to detect abnormal symptoms, fatigue, anxiety, or altitude sickness and to prescribe therapy; (3) recommending the grounding or reclassification of a pilot; (4) reporting medical findings to the group commanding officer; (5) handling medical problems of flight personnel efficiently; and (6) undertaking research on new physiological problems associated with flying.

4712
NIGHT VISION TRAINING. — U. S. Air Force Medical Service Digest, 6 (11): 15-17. Nov. 1955. DLC

The three-hour night vision course, as it is offered by the U. S. Air Force Physiological Training Program, includes a thorough study of the anatomy and physiology of the eye, of the eye reactions to low levels of illumination, and of visual aids at low levels of illumination. Each physiological training unit is equipped with a two-dimensional night-vision trainer for demonstration of the principles learned during lectures. A three-dimensional trainer is available for simulated conditions of one-fourth, one-half, or full moonlight from the side, front, aft, or directly above the aircraft.

4713
Noble, C. E.
COMPOUND TRIAL-AND-ERROR LEARNING AS A FUNCTION OF RESPONSE AVAILABILITY (N_R). — Jour. Exper. Psychol., 49 (2): 93-96. Feb. 1955. DLC (BF1.J6, v. 49)

The study involved paced four-link heterogeneous compound trial-and-error learning with immediate serial reinforcement under seven conditions of response availability (N_R) and task length held constant. A total of 336 subjects were used in a simple randomized design. To a series of four stimuli presented for 2 sec. each at a 3.44-sec. rate with a 6.88-sec. intertrial interval, the subject was required to learn an invariant sequence of four pushbutton responses. N_R exerted a highly significant retarding effect upon the rate of trial-and-error learning, in accordance with expectation. Probability of correct first choice (p_+) for three representative values of N_R yielded ogival acquisition curves as functions of trials. The curves originated at hypothetical p_+ values consistent with the initial chance solubility of each problem. The apparent inflection points were a direct function of N_R while the acquisition rates varied inversely. (Author's summary, modified)

4714
Noble, M.,
P. M. Fitts, and C. E. Warren
THE FREQUENCY RESPONSE OF SKILLED SUBJECTS IN A PURSUIT TRACKING TASK. — Jour. Exper. Psychol., 49 (4): 249-256. April 1955. DLC (BF1.J6, v. 49)

The efficiency of highly skilled subjects in tracking a target which moves in a simple harmonic motion pattern, as measured by root-mean-squared error and by time on target within 5% of the target amplitude, was found to decrease steadily as input frequency was increased. Examination of objective scores and analysis of graphic records of the problem input, subject's output, and tracking error indicate that five types of changes in motor behavior contribute to the decrease in performance proficiency: (a) variability in phase relations between stimulus and response, (b) variability of output amplitude, (c) variability in the point of termination of successive flexor or of extensor movements, (d) a constant error in matching response amplitude to the average input amplitude, and (e) loss of synchronization between output and input frequencies, i.e., periods during which the

output frequency was independent of the input frequency. During short periods of loss of synchronization the output frequency might be either higher or lower than the input frequency. These changes in performance are interpreted in relation to the hypothesis that man puts out a patterned response which he predicts will match the stimulus pattern, observes the outcome during a sampling period, and intermittently changes his output period. (From the authors' summary)

4715
Noble, R. L.
MEDICATION FOR MOTION SICKNESS PRIOR TO AND DURING WORLD WAR II. — Internat. Record Med., 168 (1): 1-12. Jan. 1955.
DLC (R11.M745, v. 168)

A review is presented of the symptoms of motion sickness with reference to the gastrointestinal tract (salivation, epigastric awareness, nausea, retching); respiratory system (decreased respiratory rate, tendency to sigh and yawn); cardiovascular system (intense facial pallor, cold sweating); and the central nervous system (psychological effects, vestibular reactions). Investigations prior to and during World War II proved that barbituric acid derivatives and various belladonna alkaloids were effective in the prevention therapy of motion sickness. A summary is included of the suggested general and drug treatment. (56 references)

4716
Noell, W. K.,
H. I. Chinn, and C. E. Haberer
ELECTROENCEPHALOGRAPHIC EVALUATION OF THE SEDATIVE EFFECTS OF ANTIHISTAMINIC DRUGS. — School of Aviation Medicine, Randolph Field, Tex. Nov. 1955. 20 p. Report no. 55-35. AD 90 700 UNCLASSIFIED

An electroencephalographic method is described to evaluate objectively the sedating characteristics of drugs. Thirty-three antihistaminics were studied in approximately 3000 subjects. The most sedating of the compounds tested were Decapryn, Benadryl, Dramamine, Trimeton, Ambodryl, and Phenergan. The least sedating compounds were Multergan, Thephorin, Antistine, Neohetramine, Pyrabrom, and Chlorbristamine. Dormison showed no hypnotic effect by this test. Caffeine was more effective in combating the sedation of Seconal than was Desoxyn or Dexedrine. The relations of chemical structure and pharmacological activity to sedative action are discussed. (Authors' summary and conclusions)

4717
NOISE HAZARDS. — Air Defense Command Surgeon's Bulletin, 2 (2): 14-15. May 1955. DNLM

Suggestions quoted from correspondence of the Surgeon General of the U. S. A. F. concerning protection from noise hazards are presented. Topics discussed include the maximum conditions of safe noise exposure, criteria of hearing impairment, use of ear defenders, and audiometric testing program procedures.

4718
NOISE HAZARDS. — Tactical Air Command Surgeon's Bulletin, 5 (8): 11. Aug. 1955. DNLM

A loss of auditory acuity of 25 decibels in the 2000 to 4000 c.p.s. frequency range was observed in a flight surgeon two hours after a flight in an H-19 helicopter. The flight surgeon has recommended that periodic audiograms be administered to crews and frequent passengers of the aircraft.

4719
Norsworthy, M. E.,
P. W. Gard, and L. B. Cochran
AN EVALUATION OF EXPERIMENTAL ANTI-BLACKOUT EQUIPMENT. — Naval School of Aviation Medicine, Pensacola, Fla. Nov. 1, 1955. iv+10 p. (Research Project no. NM 001 100 102, Report no. 4). AD 89 996 UNCLASSIFIED

An evaluation on the human centrifuge of experimental anti-blackout equipment which was designed to improve protection and comfort. The equipment which was tested did not afford a significantly greater amount of protection than the standard U. S. Navy Anti-blackout equipment. The abdominal bladders, regardless of pressure system, which covered the larger area were more effective in increasing the protection. The optimum shape and pressure were not determined. (Authors' abstract)

4720
North Atlantic Treaty Organization
ANTHROPOMETRY AND HUMAN ENGINEERING. — 123 p. London, Butterworth Scientific Publications, 1955. DLC (TL500.N6, no. 5)

A symposium on anthropometry, human engineering, and related subjects was conducted by the Advisory Group for Aeronautical Research and Development (AGARD) Aeromedical Panel of the North Atlantic Treaty Organization (NATO) on May 3 and 4, 1954, in Scheveningen, The Netherlands. Papers included in the symposium are abstracted separately as items 4075, 4082, 4258, 4275, 4372, 4670, 4759, 4978, 5010, and 5162.

4721
North Atlantic Treaty Organization
COLLECTED PAPERS ON AVIATION MEDICINE. — Presented at aeromedical panel meeting of the Advisory Group for Aeronautical Research and Development, Paris (AGARDograph no. 6). vii+209 p. London: Butterworths Scientific Publications, 1955.
DLC (TL500.N6, no. 6)

The papers contained in this publication are abstracted separately, see items no. 3826, 3870, 3975, 4064, 4192, 4249, 4513, 4536, 4560, 4573, 4641, 4700, 4787, 4867, 4882, 4977, 5000, 5165, and 5190.

4722
Nourse, P. R.,
and R. Kimes
BREATHING APPARATUS. — The Garrett Corporation, Los Angeles, Calif. U. S. Patent 2,695,609. Nov. 30, 1954. 3 leaves. DP

A fail-safe breathable gas-regulating apparatus for use at high altitudes is described and illustrated. It consists of the gas source, passage means for conducting gas from the source to a point of use, control valve, respiration response diaphragm, and mouthpiece.

4723
[THE NEW FRENCH HIGH ALTITUDE SUIT] Le nouveau vêtement de haute altitude français. — L'air (Paris), 36 (703): 39. Sept. 1955. In French. DLC (TL502.A476, v. 36)

A brief description, including an illustration, is presented of a high-altitude pressure breathing suit developed in France. Using this suit, altitudes over 20,000 meters have been attained without untoward physiological effects.

4724
Nungesser, W. C.
ACUTE COLD AND RENAL FUNCTION IN DOGS [Abstract]. — Federation Proceedings, 14 (1[I]): 108. March 1955. DLC (QH301.F37, v. 14)

Exposure of dogs for one hour to temperatures as low as 1.8° C. resulted in general decreases in renal plasma flow and chloride excretion, and in some cases lesser decreases in glomerular filtration rate and water excretion. A sharp decrease in foot temperatures and smaller decreases in back temperature were observed, suggesting a decrease in peripheral blood flow. Little change was noted in rectal temperature.

4725
Nystrom, C. O.,
R. E. Morin, and D. A. Grant
EFFECTS OF AMOUNT, RATE, AND STAGE OF AUTOMATICALLY-PACED TRAINING ON SELF-PACED PERFORMANCE. — Jour. Exper. Psychol., 49 (4): 225-230. April 1955. DLC (BF1.J6, b. 49)

Eleven groups of subjects were given ten blocks of training on the Multiple Serial Discrimeter psychomotor task, then transferred to a self-paced procedure for the remaining seven test blocks. Their training permitted study of the effects on self-paced performance of three aspects of automatic pacing. Statistically significant findings were as follows: (1) the greater the amount of automatically-paced practice during training, the greater the rate of improvement during self-paced test blocks; (2) the faster the automatically-paced practice, the greater the rate of improvement during the test blocks; (3) there was no significant effect due to early versus late automatically-paced practice on the transfer test performance, except that there was a slope interaction between stage and amount of automatically-paced practice. (Authors' summary, modified)

4726
Nystrom, C. O.,
and D. A. Grant
PERFORMANCE ON A KEY PRESSING TASK AS A FUNCTION OF THE ANGULAR CORRESPONDENCE BETWEEN STIMULUS AND RESPONSE ELEMENTS. — Perceptual and Motor Skills, 5 (Supplement 1): 113-125. 1955. DLC (BF311.P36, v. 5)

Same as the item no. 3262, vol. III.

4727
Oberth, H.
[FUNDAMENTALS OF SPACE DIVING EQUIPMENT] Grundsätzliches zur Raumtaucherrüstung. — In: Bericht über den V. Internationalen Astronautischen Kongress, Innsbruck, 5. bis 7. August 1954. [International Astronautical Congress, 5th (Innsbruck, 1954), Proceedings], p. 1-12. Wien, 1955. In German. DLC (TL787.I44, 5th, 1954)

The physical working conditions for a "diver" at an outpost in space are discussed. Ideas for construction of a space diving suit are developed emphasizing aspects which differ from the pressurized suits for stratosphere fliers. The following requirements may be met by comparatively simple devices: maintenance of sufficient internal pressure against external zero pressure; protection from harmful radiation and from collision with cosmic-dust particles; adequate freedom of motion; freedom to withdraw the arms inside the space suit; temperature control; and capacity for locomotion. Finally, guide lines are offered for the testing of such equipment on earth. (From the author's summary)

4728
O'Connor, J. M.
INFLUENCE OF FATTY ACIDS AND OF THE ADRENAL CORTEX ON THE COURSE OF OXYGEN CONSUMPTION WITH CHANGING TEMPERATURE. — Amer. Jour. Physiol., 181 (1): 89-96. April 1955. DLC (QP1.A5, v. 181)

The influence of temperature on the rate of oxygen consumption in the skin of the rat was investigated by Vierordt the method. Oxygen consumption was found to rise in seven peaks from 15° to 38° C. associated with the seven naturally occurring saturated fatty acids from caproic to stearic. Oleic acid produced a peak close to that due to lauric acid. Removal of the adrenals caused the stearic peak to fall to about 37°, the lauric and myristic peaks to become less conspicuous, and the three lowest peaks to disappear. Feeding of cortisone restored the peaks. Laparotomy and administration of cortisone and deoxycorticosterone caused the peaks to shift upwards. In the normal rat injection of ACTH or adrenaline had a similar effect. Administration of NaCl to the adrenalectomized rat resulted in an upward movement of the position of the stearic acid peak, but did not result in the reappearance of the peaks due to the lowest acids. (Author's summary, modified)

4729
O'Connor, W. F.
CONSISTENCY OF THE OFFICER-LIKE QUALITY GRADE IN NAVAL AIR TRAINING. — Naval School of Aviation Medicine, Pensacola, Fla. Special Report no. 55-15, Oct. 12, 1955. ii+5 p. AD 78 179 UNCLASSIFIED

An investigation was undertaken on 1504 naval air cadets to determine the statistical limits of the degree to which Officer-like Quality grades among the various training phases (pre-flight, basic, and advanced) measure the same aspects of officer potential. Training covered a four-year period. Results indicated that Officer-Like Quality grades, when compared between training phases, exhibit little consistency, considering that the factors studied supposedly measure the same traits in all phases. The predicitability of grades from one training phase to another was about 10% better than chance predictions.

4730
Office of Naval Operations
NIGHT FLYING SENSE. — Office of Naval Operations, Washington, D. C. Aviation Training Division. NAVAER 00-80Q-47, 1955. 43 p.
DLC (VG90.U67)

An illustrated, popular treatise on night flying is presented for naval pilot trainees. During night flying, trainees are instructed to: (1) use instruments and electronic aids; (2) plan an emergency routine ahead of time to cover any situation that may arise during flight; (3) use oxygen when flying at high altitudes; (4) learn how things look at high altitudes; (5) avoid night anxiety by developing a proper attitude during the training period; (6) keep a spotless windscreen, and know where things are in the cockpit; and (7) wear red goggles for dark adaptation during the take-off period.

4731
Ogilvie, J. C.,
J. E. B. Ryan, R. F. Cowan, and E. I. Querengesser
INTERRELATIONS AND REPRODUCIBILITY OF MEASURES OF ABSOLUTE LIGHT THRESHOLD AND SCOTOPIC ACUITY. — Jour. Applied Physiol., 7 (5): 519-522. March 1955.
DLC (QP1.J72, v. 7)

Threshold luminance was determined for two levels of acuity by presentation of Landolt rings which were either bright on a dark ground, or dark on a bright ground. In contrast to its behavior at photopic levels, the threshold was found to be lower with the former than with the latter test. Absolute threshold was observed to be a significant indicator of the threshold luminance of acuity. Reliabilities for testing criteria were obtained from retesting of subjects tested one year earlier under slightly different conditions and were found to be 0.75 for the absolute light threshold, 0.58 for threshold luminance at the higher level of acuity, and 0.89 for threshold luminance at the lower level.

4732
Ogle, D. C.
THE FUTURE OF AVIATION MEDICINE. — Courier, George Washington Univ. Med. Center, 7 (2): 20-23. June 1955. DNLM (W1.GE42, v. 7)

Aviation-medical projects of the United States Air Force include research dealing with (a) the ill effects of heat, fatigue, monotony, cold, g-forces, physical and mental stress; (b) the hazards from missiles, radiation, and disease; and (c) the development of oxygen divices, pressure suits and escape equipment. Air Force Laboratories engaged in physiological research are enumerated. The School of Aviation Medicine performs three primary functions: (1) that of teaching postgraduate medical courses as well as specialized courses for technical personnel; (2) to act as medical consultants, particularly in the field of aviation medicine; and (3) the supervision of research of a primary clinical nature.

4733
Ogle, D. C.
THE ROLE OF THE AIR FORCE IN THE MAINTENANCE OF NATIONAL HEALTH. — Military Med., 116 (1): 18-20. Jan. 1955.
DLC (RD1.A7, v. 116)

A brief enumeration is presented of the factors whereby the medical service of the U. S. Air Force influences national health. Noted is the sponsorship of many medical training, research, and health education programs. Significant within these programs are various courses in aviation medicine (those concerned with the public interest and safety of air travel, and with preventive medicine and quarantine measures required by rapid international air travel).

4734
Oleneva, G. N.
[MORPHOLOGIC BRAIN CHANGES CAUSED BY SOUND STIMULATION: EXPERIMENTAL DATA] Morfologicheskie izmeneniîa v golovnom mozgu pri deĭstvii zvukovym razdrazhitelem (Po eksperimental'nym dannym). Zhurnal nevrapatologii i psikhia-

Rats were subjected to stimulation by the sound of an electric bell which resulted in mere stimulation, trauma, or death, depending upon the intensity and duration of the sound. Stimulation, or excitation, was in the form of motor stimulation which frequently terminated in epileptic seizures, following which the rats were sacrificed for further study. The traumatic sound effects were preceded by motor excitation which was followed by severe epileptic seizures terminating in the animals' death. Autopsy observation showed macroscopically visible hemorrhages over the brain surface in most of the animals, and in some there were symmetrically distributed hemorrhages in the brain ventricles. Microscopically differential pathological changes were observed which are described in detail. The morphologic changes observed and the presence of cell division phases suggested that cell division of the nerve cells was the primary nervous reaction to the overpowering sound stimulation. The reaction to the sound stimulation was of the type of parabiosis, which, in effect, was the specific biogenic stimulating agent determining the course of cell division.

4735
Olmstead, D. W.,
and E. D. Monachesi
ASSESSMENT OF LEADER ADEQUACY FROM STRUCTURED QUESTIONNAIRE RESPONSES OF VOLUNTARY GROUP MEMBERS. — Univ. of Minnesota. Dept. of Physiology, Minneapolis (Contract N8 onr 66216). Technical Report no. 6 on Research on Group Structure and Function as Related to the Personality Characteristics and Interests of Group Members, Aug. 1955. 71 p. AD 72 939 PB 122936

The data consist of the responses of 451 subjects to 22 fixed-response items concerning the group leader's behavior and adequacy as a leader. The utility and power of the analysis of variance techniques with sociological data were demonstrated. Methods were developed of determining whether the questionnaire responses of group members show sufficient concensus to justify the use of central tendency values as group measures. A group-response adjustment procedure designed to eliminate or reduce the effects of halo and differential question bias is presented, allowing latent response patterns to appear and be interpreted. An objective respondent typology was derived which

permits the response patterns of group members to be linked to individual personality differences. (AD abstract, modified) (42 references)

4736
Olsen, N. S.,
G. G. Rudolph, and F. Gollan
ELECTROLYTE TRANSFERS IN PLASMA, SKELETAL MUSCEL, AND HEART OF NORMO- AND HYPOTHERMIC DOGS DURING HYPERVENTILATION AND ANOXIA [Abstract]. — Federation Proceedings, 14 (1^{I}): 108-109. March 1955.
DLC (QH301.F37, v. 14)

The concentrations of radioactive K, Na, and Br 15 hours after intravenous injection were measured in the plasma, skeletal muscle, and right auricle of dogs during anoxia (3 minutes) or hypothermia. Hypothermia was observed to cause a decrease in sodium and potassium levels and an increase in bromide in all parameters measured. The ratio of potassium to sodium decreased in skeletal muscle and increased in the auricle. During anoxia in normothermic and hypothermic animals bromide levels fell in the plasma and rose in muscle, while potassium increased in plasma and decreased in muscle.

4737
Olsen, O.,
and R. Brice
[CRITICAL FLICKER FUSION FREQUENCY: CONCERNING ITS VALUE AS A TEST OF FATIGUE] La fréquence critique de fusion du scintillement: recherches concernant sa valeur en tant que test de fatigue. — Médecine aéronautique (Paris), 10 (4): 499-506. 1955. In French.
DLC (TL555.M394, v. 10)

Experiments were conducted to determine the value of a test of critical flicker fusion frequency (CFF) as an indicator of fatigue, particularly in aviation personnel. In initial studies, it was found that the CFF remained constant in subjects in good health tested at the same time in the morning and under the same conditions. After work requiring attention, such as microscope or microfilm study, an initial increase in the CFF was noted, followed by a decrease. In a second series of experiments, subjects were studied before and after a test of endurance which involved mountain climbing and poor nutrition for a period of six days. All reported fatigue after the experience. In 16 of the 20 subjects the CFF had decreased after the experience by 0.5-3 flickers per second, in 2 subjects there was a slight increase, and in 2 there was no change. Although a correlation appears to exist between decreased CFF and fatigue (the initial increase after exercise of attention was attributed to stimulation of the cortex), the many inherent variables of the problem make further study imperative.

4738
ONE-ENGINE PROCEDURE NOT USED. — Aviation Week, 62 (26): 68-74. June 27, 1955.
DLC (TL501.A8, v. 62)

A full report of the crash of a Lockheed Lodestar near Hartford, Conn., is presented. The Civil Aeronautics Board attributed the crash to the pilot's failure to use full available power and to adopt accepted single-engine procedure after feathering of one propeller became necessary.

4739
O'Neill, J. J.
A COMPARATIVE STUDY OF INTELLIGIBILITY VALUES: FORMS A AND B. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 47, April 1, 1955. iii+[25] p. (Project no. NM 001 104 500.47). AD 62 423 PB117655

Two panels of 87 listeners each were presented words from Forms A and B of the multiple-choice intelligibility tests. The words were presented either in their original form or as write-drwn items. The values obtained for the two types of tests were compared statistically. There was a correlation of $r = .43$ between the write-down and multiple-choice values of Form A, and a correlation of $r = .26$ between the two sets of values for Form B. The obtained item values as well as values obtained by three other investigators are presented for use in future research which would utilize similar experimental conditions. (Author's abstract)

4740
Ordway, F. I.
and H. E. Canney
THE RESPECTABILITY OF ASTRONAUTICS AS REFLECTED BY RECENT DEVELOPMENTS IN THE UNITED STATES. — In: Bericht über den V. Internationalen Astronautischen Kongress, Innsbruck, 5. bis 7. August 1954 [International Astronautical Congress, 5th (Innsbruck, 1954), Proceedings], p. 226-247. Wien, 1955. In English.
DLC (TL787.I44, 5th, 1954)

The status of physical and medical research of the upper atmosphere and space in the United States is reviewed.

4741
Orzack, M. H.,
and T. F. Schlaegel
THE LIEBMANN EFFECT IN BINOCULAR PERCEPTION: PRELIMINARY STUDIES. — Amer. Jour. Ophthalmol., 39 (2): 93-98. Feb. 1955.
DNLM

The Liebmann effect (when a colored figure and its neutral background are equally luminous and fixation is maintained at the center, the figure appears to lose its clarity and fade into the background) was studied binocularly by using a stereoscopic projector and auxiliary filters. The following conclusions were drawn: (1) the larger a diamond figure the more quickly and more frequently it disappears, and the longer it remains invisible; (2) the larger the ground, the less frequently a disc figure disappears and (3) partial disappearance invariably precedes total disappearance. (Authors' summary, modified)

4742
O[smun], W. G.
WIDE VISION FILM SOLVES PILOT TRAINING PROBLEM. — Aviation Age, 23 (5): 162-165. May 1955. DLC (TL501.A8187, v. 23)

An experimental wide-vision color moving picture has been produced by Pan American Airways as a substitute for the present Civil Aeronautics Board (CAB) requirement that all pilots, before

flying a regular route, have actual experience in approaching each regular and provisional airport along the route. The film was taken from the pilot's position in the cockpit of a DC-3, and is accompanied by a running narration which describes the approach and points out features of the airport and the approach and departure patterns. Experimental showings of the film have led the CAB to consider allowing such alternatives to the flight program now established. It is also planned to use the film with a flight simulator for pilot training.

4743
Packchanian, A. 1954
ALTITUDE TOLERANCE OF NORMAL AND INFECTED INSECTS. — Jour. Economic Entomol., 47 (2): 230-238. April 1954. DNLM

Five species of arthropods (Aedes aegypti, Bdellonyssus bacoti, Culex quinquefasciatus, Musca domestica, and Triatoma gerstaeckeri) were exposed for different periods of time to low temperatures and negative pressure conditions corresponding to various altitudes. All species were killed within four hours at a simulated altitude of 15,000 feet. All insects exposed to 10,000 feet survived and resumed their normal activities. Musca domestica infected with Herpetomonas muscae domesticae, exposed to a temperature of -15° C. for two hours, and Triatoma gerstaeckeri, infected with Trypanosoma cruzi, exposed to a temperature of -44° C. for two hours, all died; the flagellates, however, remained alive and active within the dead insects. (From the author's summary)

4744
Packchanian, A.
THE EFFECT OF SIMULATED ALTITUDE ON CERTAIN INSECT EGGS. — Texas Reports on Biol. and Med., 13 (3): 454-469. Fall 1955. DLC (R11.T4, v. 13)

Eggs or pupae of the following insects were exposed to various simulated altitudes in a refrigerated vacuum chamber: Aedes aegypti, Anopheles quadrimaculatus, Culex quinquefasciatus, Oncopeltus fasciatus, Pediculus humanus corporis, Rhodnius prolixus and pupae of Musca domestica and Xenopsylla cheopis. Injurious effects of certain altitudes to eggs or pupae differed somewhat in different species. Some survived for several hours of exposure to conditions simulating 15,000 feet, while the same conditions were apparently lethal to other species. Exposure to 22,500 feet or 30,000 feet for 15 minutes was detrimental to all eggs and pupae, none hatched after such exposure. Altitudes below 22,500 feet required longer exposure periods to kill insect eggs or pupae. Included are eight tables.

4745
Packchanian, A.,
and M. Pinkerton
FURTHER STUDIES ON THE EFFECT OF SIMULATED ALTITUDE ON EIGHT ADDITIONAL SPECIES OF ARTHROPODS. — Texas Reports on Biol. and Med., 13 (4): 865-881. Winter 1955. DLC (R11.T4, v. 13)

The following species of arthropods were subjected to simulated altitudes in an altitude chamber equipped to produce low temperatures with corresponding reduced atmospheric pressures: Amblyomma americanum, Anopheles quadrimaculatus, Apis mellifera, Drosophila melanogaster, Oncopeltus fasciatus, Rhodnius prolixus, Triatoma phyllosoma, and Xenopsylla cheopis. Most species survived two hours of exposure to an altitude of 10,000 feet. All arthropods died within 15 minutes at an altitude of 30,000 feet. Exposure at simulated intermediate altitudes produced paralysis or death. The altitude factor responsible for the detrimental effect on insects is low temperature and not reduced pressure. Microfilariae, herpetomonas, and trypanosomes in the intestines of infected insects were found to survive conditions of 30,000 feet after exposure for periods ranging from 2 to 24 hours, although these conditions invariably killed insects within 15 minutes. (From the authors' summary)

4746
Paganelli, A.,
and C. Colella
[TRAUMATIC FRACTURE OF THE CARPAL SCAPHOID] La frattura traumatica dello scafoide carpale. — Rivista di medicina aeronautica (Roma), 18 (4): 819-839. Oct.-Dec. 1955. In Italian, with English summary (p. 837). DLC (TL555.A1R5, v. 18)

A report is presented of cases of fracture of the carpal scaphoid [naviculare] in parachutists. Fracture is attributed primarily to landing on the palm of the hand (or on the back of the hand). A classification of carpal scaphoid fractures is given and the mechanism of fracture formation described following an anatomical study of the wrist. In addition, a discussion is presented on X-ray diagnosis and the technique of treatment by means of immobilization.

4747
Pagé, E.,
L. M. Babineau, and J. P. Lachange
CARBOHYDRATE UTILIZATION IN RATS ADAPTED TO COLD. — Revue canadienne de biologie (Montreal), 14 (2): 144-151. Sept. 1955. DLC (QH301.R47, v. 14)

Rats adapted to cold and fed a high carbohydrate diet showed higher fasting liver glycogen values, higher intestinal absorption rates of glucose, and larger deposition of liver glycogen at comparable rates of glucose absorption (intestinal or peritoneal) than controls kept at room temperature. More liver glycogen was formed when glucose was absorbed by the intestinal route than following its administration intraperitoneally. (Authors' summary, modified)

4748
Pall, F. A.,
and L. A. Pfankuch
ADJUSTABLE VEHICLE SEAT. — Consolidated Vultee Aircraft Corp., San Diego, Calif. U. S. Patent 2,669,284. Feb. 16, 1954. 4 leaves. DP

A vehicle operator's seat was designed to provide (1) improved strength-weight characteristics necessary for the transferral of decelerative forces to the structural framework of aircraft during impact, while permitting a wide range of adjust-

ment; (2) an improved means for the attachment of such seats; (3) easy installation; and (4) adjustment controls positioned so that they may be easily operated without interference with the normal functions of the occupant.

4749
Papst, W.
[THE ELECTRORETINOGRAM AND ELECTROCORTICOGRAM OF THE RABBIT IN HYPOGLYCEMIA AND ANOXIA] Das Elektroretinogram und das Elektrocorticogramm des Kaninchens bei Hypoglykämie und Anoxie. — Albrecht von Graefes Archiv für Ophthalmologie (Berlin), 157 (2): 122-139. 1955. In German. DNLM

The electric potentials of the retina and cerebral cortex were determined during insulin produced hypoglycemia and anoxia produced by N_2 breathing. In anoxia, the time to disappearance of electric impulses in the retina declined from 16 minutes with a normal blood glucose level to 60 seconds during hypoglycemia, and was increased by hyperglycemia. The electrocorticogram, in contrast, was unaffected by hyperglycemia. Thus the retina was shown to be more sensitive to glucose lack, and more dependent on glucose reserves, than the cortex.

4750
PARACHUTE SAFETY. — Tactical Air Command Surgeon's Bulletin, 5 (4): 7-9. April 1955. DNLM

It is suggested that a program of parachute training for flying personnel be instituted including the following features: (1) instruction adequate to eliminate fear of parachuting; (2) ground instruction in landing procedures, parachute control in the air, and parachute collapsing; (3) use of parachutes of proper size for the weight of individual airmen; (4) instruction in the proper care of parachutes; and (5) bail-out instruction for passengers flying in military type aircraft.

4751
Parker, J. F.,
and R. C. Hackman
THE PREDICTION OF A CRITERION OF FLIGHT SAFETY IN NAVAL AVIATION. — Naval Medical Research Inst., Bethesda, Md. (Project no. NM 001 056.08.01). Research Report (Vol. 13, p. 363-407), Aug. 1, 1955. AD 76 465 UNCLASSIFIED

Differential accident proneness among naval flight personnel was investigated. The following variables were examined in terms of their relationship to a pilot's placement on continua of safeness and skill as a pilot: (1) attitudes toward various aspects of naval flying; (2) subjective evaluations of flight safety procedures; and (3) the galvanic skin response of a pilot recorded as he views statements concerning these items of flight safety procedure. Pilots were evaluated by means of peer ratings, the other members of their squadron both as to safeness and skill. Multiple regression analyses indicated that major differences exist between low-ranking and high-ranking officer groups with respect to the manner in which the above variables are related to the criteria. Such differences may be a function of greater experience in flying on the part of the high-ranking officers. For predicting relative safety and skill, multiple correlation coefficients were obtained ranging from .48 to .68. On the basis of this study, the use of peer rating procedures as a means of establishing criteria of differential accident liability is recommended. (From the authors' abstract)

4752
Parrack, H. O.
NOISE AND VIBRATION CONTROL IN THE U. S. AIR FORCE. — Jour. Aviation Med., 26 (2): 146-155. April 1955. DLC (RC1050.A36, v. 26)

The author describes the program to solve the problem of noise and vibration, carried out by the Wright Air Development Center. The major aims of the program are: development of systems to reduce hazardous acoustic vibrations and human exposure to them; planning of air bases with sound control in mind; control of sound vibrations generated by propulsive devices. The three major variables which are concerned with the problem are: acoustic energy sources, transmission media, and acoustic energy receivers (man and mechanical structures). Man's response to such vibrations must be studied in relation to: mechanical properties of the body surface, mechanical properties of tissues, mechanical properties of sensory receptors, functional properties of the sensory input system, interactions of such systems, the effects of this interaction upon the central nervous system, central nervous system concomitants of abnormal activation of a sensory system, complex human reactions, and complex reactions of communities of men.

4753
PARTIAL PRESSURE SUIT TRAINING. — U. S. Air Force Medical Service Digest, 6 (11): 17-19. Nov. 1955. DLC

The partial-pressure suit training program is administered over a five-day period. The lectures are designed to acquaint the crew members with the physiological limitations of man, the theory of partial-pressure suits, the normal respiratory limits of man, and the respiratory requirements of man at high altitudes. The role of the partial-pressure suit in preventing dysbarism associated with gas expansion and with evolved gases is explained. Each trainee is then fitted individually with a partial-pressure suit which remains in his possession as long as it is needed operationally. Prior to low-pressure chamber ascents, the trainee performs breathing exercises while wearing the suit and the helmet. The actual altitude-chamber training involves ascents to 40,000 ft. and 65,000 ft.

4754
Passarelli, R.
[HOW TO AVOID COLLISIONS IN VISUAL FLIGHT] Cómo evitar las colisiones en vuelo visual. — Revista nacional de aeronáutica (Buenos Aires), 15 (162): 62-63, 85. Sept. 1955. In Spanish. DLC (TL504.R547, v. 15)

Aircraft collisions during visual flight are discussed in the age of high-speed aircraft and increased air traffic. The major cause of collision is attributed to the pilot's abandonment of vigilance. Other causative factors include the limitation of the pilot's visual field, as produced by the position of the sun, and the difference in various types of planes resulting in poor aircraft maneuverabil-

ity by the pilot. In order to avoid collisions, a proposal is presented for a system regulating visual flight whereby the pilot, when seeing another plane approach, is to observe standard minimum safety distances and to follow established maneuver rules necessitated by special situations. These situations may be produced by (1) aircraft approaching from the front; (2) aircraft meeting at approximately the same level, and (3) aircraft overtaking each other. The effectiveness is noted of this system for visual flight.

4755
PATHOLOGICAL CORRELATION OF AIRCREW FATALITIES. — Tactical Air Command Surgeon's Bulletin, 5 (8): 1-6. Aug. 1955. DNLM

A summary is given of papers presented at a meeting on the pathological correlation of aircrew fatalities conducted at the Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington, D. C., on March 17 and 18, 1955. Topics discussed include the need for pathological investigation in unexplained aircraft accidents, electron microscopic observations of the lungs of rats exposed to explosive decompression, pathological findings in the crash of two Comet jet transports, observations of fat emboli in the lungs of air accident victims, observations of rats quick-frozen during acceleration, and techniques of accident investigation.

4756
Paul, M. C.
A METHOD OF SEALING AND GAS-CONDITIONING AN ORBITAL DUTY SURVIVAL SUIT. — Jour. Brit. Interplanetary Soc. (London), 14 (6): 300-306. Nov.-Dec. 1955. DLC (TL790.A1B7, v. 14)

The basic properties of a space survival suit are discussed. The construction and operation of the Annular Waist Seal are examined together with relevant suit-envelope problems and design. Results derived in the testing of a crude prototype seal are also examined. A gas-conditioning system is outlined permitting a minimum of internal suit apparatus and wiring. The practical criteria considered are: high safety-factor, unassisted operation of the seal, a reasonable degree of limb and body movement, the exchange of attached supply units under spacial conditions and the anchoring of safety-lines and propulsion-unit to the suit's exterior. (Author's summary)

4757
Payne, R. B.,
and G. T. Hauty
EFFECT OF PSYCHOLOGICAL FEEDBACK UPON WORK DECREMENT. — Jour. Exper. Psychol., 50 (6): 343-351. Dec. 1955. DLC (BF1.J6, v. 50)

After preliminary training 144 subjects performed a complicated compensatory pursuit task involving simulated aircraft instruments and controls for four hours. Experimental conditions involved 36 combinations of three directive feedback treatments, three incitive feedback treatments, and four pharmacological treatments. Evaluation was in terms of subjective dispositions and task performance and their interrelationship. Directive feedback signals induced an increment in task proficiency which remained constant throughout the experiment, except for the terminal stages of performance under analeptic and depressant conditions. Incitive feedback did not postpone work decrement longer than for the first hour under any condition. Dexedrine minimized work decrement, while a hyoscine and diphenhydramine hydrochloride mixture increased and hastened it. Performance effect could not be accounted for by the respective effects on subjective disposition.

4758
Payne, R. B.,
and G. T. Hauty
FACTORS AFFECTING THE ENDURANCE OF PSYCHOMOTOR SKILL. — Jour. Aviation Med., 26 (5): 382-389. Oct. 1955.
DLC (RC1050.A36, v. 26)

This article concerns the authors' work on the methodology, predictability, and counteraction of work decrement in a task involving complex psychomotor skill. The USAF SAM Multidimensional Pursuit Test (CM813E) was used as a laboratory device as was the USAF SAM Airplane Control Test; a significant decrement occurred during the first 2 hours of a 4-hour test period with nearly all subjects. The predictability of individual susceptibility to work decrement was studied and showed promise; it is still being investigated. Counteraction of work decrement was also studied in the form of such countermeasures as single and joint efficacy of pharmacological stimulants, motivational techniques, and task design factors. Only the pharmacological stimulant, dextroamphetamine sulfate, arrested work decrement.

4759
Payne, R. B.
FACTORS AFFECTING THE VALIDITY AND UTILITY OF AEROMEDICAL RESEARCH DATA. — In: North Atlantic Treaty Organization, Anthropometry and human engineering, p. 77-89. London, Butterworths Scientific Publications, 1955.
DLC (TL500.N6, no. 5)

It is suggested that full cooperation between scientist and statistician at an early stage of research is essential to the determination of efficient experimental designs and to the prevention of ambiguity in results due to inadequate sampling procedures or to intervention of extraneous factors. Statistical analysis of results serves to extract often obscured information and to ensure valid interpretation of experimental data. The author's suggestions are illustrated by various examples of proper and improper experimental designs.

4760
Payne, R. B.,
and G. T. Hauty
THE INFLUENCE OF DRUGS, MOTIVATION, AND JOB DESIGN UPON WORK DECREMENT. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-16, Jan. 1955. 12 p. AD 69 413
PB 117103

One hundred forty-four volunteer basic airmen received preliminary training on a complicated compensatory pursuit task involving simulated aircraft instruments and controls, then continued work for 4 hours after having been randomly and equally distributed among 36 combinations of four

pharmacological treatments, three error feedback treatments, and three motivational feedback treatments. The treatment effects were appraised in terms of task proficiency and subjective disposition, and the functional connection between these outcomes was explored. The following conclusions seem justified: (1) A 5 mg. dose of dextroamphetamine sulfate postpones or minimizes work decrement long enough to be of practical interest to the Air Force. (2) The instantaneous feedback of performance error by means of supplementary visual cues promotes task proficiency for at least four hours. (3) The repetitive feedback of information concerning progress relative to performance standards enhances task proficiency, presumably through its motivational properties. And (4) pharmacological, engineering, and motivational treatments can be compounded for maximal sustentation of task proficiency. (From the authors' summary and conclusions)

4761
Payne, R. B.
SOME EFFECTS OF MOTION SICKNESS REMEDIES UPON PSYCHOLOGIC PERFORMANCE. — Internat. Record Med., 168 (1): 32-40. Jan. 1955.
DLC (R11.M745, v. 168)

A review is presented of the literature and experiments dealing with the effect of motion sickness drugs on psychological performance, ranging from simple sensory and perceptual-intellectual and -motor functions measured in the laboratory to complex navigation tasks carried on in aircraft at altitude. It is suggested that (1) all remedies showing useful prophylaxis of motion sickness be appraised across a broad spectrum; (2) dose response nomographs be constructed for the more important skills so that different quantities of different remedies can be compared on some common ground; and that (3) the number of studies involving secondary conditions, both mitigative and exacerbative, be increased. (30 references)

4762
Payne, R. B.
SOME PSYCHOLOGICAL FACTORS GOVERNING THE IMPAIRMENT OF VERBAL RETENTION BY CEREBRAL DEPRESSANTS. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-52, July 1955. 9 p. AD 81 796 UNCLASSIFIED

Directional hypotheses concerning (a) the general effects of certain drugs upon the retention of a serial order verbal task, (b) the general effects of overlearning and motivation upon such retention, and (c) the interaction of drug effects with training and motivation effects were tested in a factorial experiment involving 96 subjects. Experimental criteria consisted of (a) savings scores, (b) trials required to relearn, (c) number of items recalled on the first relearning trial, and (d) average error per relearning trial. Those hypotheses pertaining to the general effects of the experimental factors across all levels of the others were not well supported. In the case of drugs this was due to the fact that both overlearning and motivational feedback factors forestalled impairment. Thus, the interaction hypotheses were well substantiated. In the case of overlearning, the lack of strong, general effects was probably due to lack of opportunity owing, first, to the partial overlearning already generated during original mastery, and, second, to the positive influences of motivational feedback. In the case of motivational feedback the lack of general influence was due largely to lack of opportunity owing to the strong, positive influence of overlearning. (Author's summary and conclusions)

4763
Pearl, B. E.,
J. R. Simon, and Karl U. Smith
VISUAL TRACKING. IV. INTERRELATIONS OF TARGET SPEED AND AIDED-TRACKING RATIO IN DEFINING TRACKING ACCURACY. — Jour. Applied Psychol., 39 (4): 209-214. Aug. 1955.
DLC (BF1.J55, v. 39)

The effect of three variations in target speed and three aided-tracking time constants on accuracy of visual tracking was investigated. The task of the subject was to keep a cursor aligned with a moving target by adjusting a handwheel on a specially designed aided-pursuit tracking device. Each of the 27 subjects performed on all nine combinations of target speed and time constant. Time scores which integrated time on target and magnitude of error provided the measure of tracking accuracy. The time constant of 0.5 sec. remained optimum over the range of target speeds used in this study although there was not a statistically significant difference between the .25 and 0.5 sec. time constant. The 1.0-sec. time constant was significantly inferior. There was a significant interaction between aided-tracking time constant and target speed. In other words, the relative effectiveness of a given time constant depends on the particular target speed used. A motion resonance theory of tracking was proposed to account for the main phenomena of aided tracking. (Authors' summary, modified)

4764
Perdriel, G.,
J. Colin, and R. Brice
[A NEW APPARATUS FOR THE TRAINING OF NIGHT VISION] Un nouvel appareil d'entrainement à la vision de nuit. — Médecine aéronautique (Paris), 10 (4): 507-512. 1955. In French.
DLC (TL555.M394, v. 10)

An apparatus for the training of night vision in aviation personnel through the projection on a dark field of an approaching airplane at varying angles is described. Factors in the training of night vision are also described.

4765
Perdriel, G.
[CONCERNING A CASE OF SEROUS CENTRAL CHOROIDITIS IN A RADAR OPERATOR] A propos d'un cas de choroidite séreuse centrale chez un opérateur de radar. — Médecine aéronautique (Paris), 10 (3): 255-257. 1955. In French.
DLC (TL555.M394, v. 10)

A case of central choroiditis observed in a radar operator is described, and the affliction attributed to the frequent dazzling illumination to which the victim was exposed. It is suggested

that rigorous conditions of visual aptitude, periodic surveillance, improvement of working conditions, and general hygiene to prevent the appearance of tuberculosis (a contributory cause of choroiditis) be applied to prevent the further occurrence of the disease.

4766
Pernazza, P.
[CYBERNETICS AND FLIGHT] La cibernetica e il volo. — Rivista aeronautica (Roma), 31 (11): 1219-1236. Nov. 1955. In Italian.
DLC (TL504.R54, v. 31)

Cybernetics is discussed with reference to general instrumentation of airplanes. Cybernetic principles are utilized in the design of standard instruments and instrument groups for manual and emergency use; instruments for automatic pilot flight; semiautomatic integrators and indicators; and automatic course and position indicators. Automation in general, and automatic pilot in particular, are considered as negative factors in training, and for the technical and professional ability of navigators.

4767 1954
Perret Gentil, A.
[TECHNIQUE OF VERGENCE TESTS IN THE EXAMINATION OF CIVILIAN PILOTS] Técnica de las pruebas de vergencias en los exámenes para pilotos civiles. — Ciencia aeronáutica (Caracas), 1 (3): 16. Dec. 1954. In Spanish. DLC

A brief discussion is presented on the technique of vergence tests used for the ocular examination of civilian pilots. Variations found during vergence measurements depend on the degree of fatigue in the pilot. The most frequent defect found is convergence insufficiency, which can be corrected with adequate ocular exercises.

4768
Perry, M. E.
NUTRITION AND FLIGHT. — Internat. Record Med., 168 (9): 580-582. Sept. 1955.
DLC (R11.M745, v. 168)

A pre-flight meal should be selected carefully and eaten 1-2 hours prior to take-off. Foods that are greasy or insufficiently cooked, highly seasoned, gas-forming, or high in roughage and foods to which the individual is allergic or which he does not tolerate should be eliminated from the diet. Pilots should not drink alcoholic beverages at least 12-24 hours prior to flight and carbonated beverages 1-2 hours prior to flight. In-flight meals should be light, bland, palatable, satisfying and nutritious. Food intake is recommended at two-hour intervals with a light meal every four hours if possible and in small quantities.

4769
Peskin, J. C.
THE CHEMISTRY OF RETINAL PIGMENTS. — In: Office of Naval Research, Symposium on physiological psychology, p. 70-82. ONR Symposium Report ACR-1, March 10, 11, 1955. AD 80 100
UNCLASSIFIED

Evidence is presented that the photosensitivity of visual purple is due to formation of bonds with active groups existing in the protein portion of the molecule, rather than bonds resulting from the combination of retinene and primary amines.

4770
Peskin, J. C.
HUMAN ENGINEERING RESEARCH IN THE AREA OF COLOR PERCEPTION: THE RELATIONSHIP OF THE COLOR AND BRIGHTNESS OF BACKGROUND TO THE PERCEPTION OF COLORED TEST OBJECTS. — Univ. of Rochester, N. Y. (Contract AF 30(602)-109). Final Report, March 25, 1955. 13 p.
AD 76 361 PB 126411

Visual threshold measured as flash perception or as structure identification and the minimal perceptible increment of illumination were determined under varying conditions of background and test patch color and illumination. An increase in one threshold criterion was observed to parallel an increase in the other; as individual sensitivity decreased, however, the perception-of-form threshold increased more rapidly. The minimal perceptible increment of white light and of a series of narrow band spectral regions was found to decrease rapidly from that measured at the threshold of the adapting field and then reach a minimum. The determinant for perception of the minimal stimulus appeared to be the brightness relationship rather than other factors. When extreme blue was used as the test flash, it was recognized at minimum brightness in comparison to all other test patches. As the wavelength of test patches increased toward the red, the least perceptible fraction increased more rapidly with increasing wavelength. It is suggested that when dark adaptation is to be preserved, a blue signal superimposed on a red background be used. (AD abstract, modified)

4771
Peters, R. W.
CHANGES IN VOICE INTELLIGIBILITY, SOUND PRESSURE LEVEL OF RESPONSE, AND DURATION OF RESPONSE AS A FUNCTION OF THE SPEAKER'S BEING REPEATEDLY INFORMED THAT HE IS NOT BEING UNDERSTOOD BY HIS LISTENERS. — Ohio State Univ. Research Foundation, Columbus (Contract N6onr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no. 50, May 1, 1955. iii+7 p. AD 68736 PB 118625

Criterion measures of voice intelligibility, relative sound pressure level of response, and duration of response were determined for 24 speakers who were repeatedly informed during their reading of testing materials that their voice transmissions were not being understood by their listeners. Voice intelligibility did not progressively improve even when significant increases in both sound pressure level and duration of vocal responses resulted from an increase in the number of times the speaker was informed that he was not being understood. (Author's abstract)

4772
Peters, R. W.
THE EFFECT OF LENGTH OF EXPOSURE TO SPEAKER'S VOICE UPON LISTENER RECEPTION. — Ohio State Univ. Research Foundation, Columbus (Contract N6onr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no. 44, March 1, 1955. iii+8 p. AD 62 340 PB 117651

Listeners who had received either no exposure, two-minute exposure, four-minute exposure, or eight-minute exposure to speakers' voices responded to the speakers' reading of intelligibility lists. Reception values for listening in quiet were significantly higher for the listeners who were exposed to the speakers' voices two, four, or eight minutes than were the reception values for listeners who had not been exposed to the speakers' voices. Reception values for listening in noise were significantly higher for listeners who were exposed to the speakers' voices for eight minutes as compared to reception values for listeners who were not exposed to the speakers' voices or who were exposed to the speakers' voices for two minutes or four minutes. Mean values of listener reception did not follow the same trend for each speaker. (Author's abstract)

4773
Peters, R. W.
THE EFFECT OF LOW-PASS FILTERING OF SIDE-TONE UPON SPEAKER INTELLIGIBILITY. — Ohio State Univ. Research Foundation, Columbus (Contract N6onr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no. 49, April 30, 1955. iii+8 p. AD 68 731 PB 118455

Criterion measures of voice intelligibility were determined for 24 speakers who read intelligibility testing materials under two conditions of filtered side-tone and two conditions of nonfiltered side-tone. The purpose of the experiment was to evaluate speaker intelligibility as a function of frequency attenuation above 600 c.p.s. in the side-tone signal, and to evaluate whether the improvement in speaker intelligibility which was found to accompany low-pass filtering of side-tone in previous experimentation was a function of the decreased level side-tone produced by filtering or was primarily a function of the frequency effects of filtering. The results indicate that speaker intelligibility improves as frequencies above 600 c.p.s. in the side-tone signal are attenuated, and that this change appears to be primarily a function of the attenuation of the higher frequencies of the side-tone signal. (Author's abstract)

4774
Peters, R. W.
THE EFFECT OF RECALL AND PROBLEM-SOLVING TASKS, CONCURRENTLY PRESENTED WITH INTELLIGIBILITY TESTING MATERIALS, UPON LISTENER RESPONSES TO THE INTELLIGIBILITY MATERIALS. — Ohio State Univ. Research Foundation, Columbus (Contract N6onr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no. 59, Aug. 1, 1955. iv+[16] p. AD 94 575 PB 125862

Listeners responded concurrently to intelligibility and recall or problem-solving materials. Reception values for the listeners were evaluated with respect to the conditions of no task and each of five conditions of increasing difficulty of the recall and problem-solving. The recall materials were digits, nonsense syllables, or words; the problem-solving tasks were arithmetic problems or arranging scrambled letters into words. With the recall of digits and nonsense syllables, reception values of listeners decreased with increased difficulty of the task; with the recall of words and the solution of arithmetic and scrambled letters problems, listener reception improved when the task was moderately difficult. (Author's abstract)

4775
Peters, R. W.
LISTENER PERFORMANCE AS A FUNCTION OF LISTENING TIME FOR VARIOUS SIGNAL-TO-NOISE CONDITIONS. — Ohio State Univ. Research Foundation, Columbus (Contract Nonr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no. 53, June 1, 1955. ii-8 p. AD 91 317 PB 122398

The reception of word messages in quiet and in five conditions of noise (+6 to -6 db. signal level relative to 90 db. noise level) composed of two superimposed voices was determined during a one-hour continuous testing period. Performance showed an early improvement under all noise conditions, and a sustained improvement in quiet. With continued testing in noise, a temporary decrement in reception was observed which was more pronounced and more sustained as the signal-to-noise ratio was decreased.

4776
Peters, R. W.
THE RELATIVE INTELLIGIBILITY OF SINGLE-VOICE AND MULTIPLE-VOICE MESSAGES UNDER VARIOUS CONDITIONS OF NOISE. — Ohio State Univ. Research Foundation, Columbus (Contract N6onr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no. 56, July 1, 1955. ii+9 p. AD 91 320 PB 122401

Evaluations were made of the relative intelligibility of single-voice and multiple-voice transmissions under various conditions of noise. The hypothesis under test was that continuity of voice during a transmission contributes to the efficiency of listener reception. The results supported the hypothesis in that single-voice transmissions were consistently more intelligible than were multiple-voice transmissions. Mean values of intelligibility, under increasing levels of noise, did not follow the same trend for the two kinds of transmissions. The multiple-voice transmissions became relatively less intelligible under increasing levels of noise than did the single-voice transmission. (Author's abstract)

4777
Peters, R. W.
STUDIES IN LISTENER RECEPTION OF VOICE MESSAGES: THE PERSISTENCE OF THE EFFECTS

OF LISTENING CONDITIONS. — Ohio State Univ. Research Foundation, Columbus (Contract N6onr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no. 55, June 30, 1955. ii+7 p. AD 91 319 PB 122400

An evaluation was made, with respect to mean values of listener reception, among three listener groups who immediately prior to responding to test materials responded to similar materials under one of three signal-to-noise ratio conditions. The three signal-to-noise ratio conditions were +8 db., 0 db., and -8 db. Test materials were presented to all listeners at a 0 db. signal-to-noise ratio. The results indicated than mean reception was significantly lower for the listeners who were indoctrinated at the -8 db. signal-to-noise ratio than for the listeners who were indoctrinated at the +8 db. and 0 db. signal-to-noise ratio prior to their responding to test materials. (Author's abstract)

4778
Peters, R. W.
VOICE INTELLIGIBILITY AS A FUNCTION OF SPEAKERS' KNOWLEDGE CONCERNING THE CONDITIONS UNDER WHICH THEIR TRANSMISSIONS WILL BE RECEIVED BY LISTENERS. — Ohio State Univ. Research Foundation, Columbus (Contract N6onr 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project no. NM 001 104 500). Joint Project Report no. 41, Feb. 1, 1955. iii+7 p. AD 62 326 PB 117619

Speakers read multiple-choice intelligibility test words immediately after receiving voice transmissions under conditions of quiet or under various levels of noise. The speakers were informed that these transmissions represented conditions under which listeners would hear their voices. Among the speakers employed was a group of speakers not experienced in military voice communication procedure and a group experienced in these procedures. Of the speakers used, only those who were inexperienced in communication procedures became more intelligible in response to information that listeners would hear their voices under conditions of noise as opposed to conditions of quiet. In no instance did voice intelligibility vary consistently as a function of the amount of noise accompanying transmissions to the speaker. (Author's abstract)

4779
Petersen, R. L.
CREW COORDINATION AND SAFETY OF FLIGHT. — Combat Crew, 5 (11): 24-26. May 1955. DLC

Hazardous incidents resulting from poor crew coordination are cited to illustrate the necessity for improved crew communication, cooperation, and responsible performance of duties.

4780
Petty, T.,
W. Bartlett, and J. L. Chapin
EFFECTS OF ALTITUDE, ACIDOSIS, AND ALKALOSIS UPON HYPOXIC THRESHOLD. — Proc. Soc. Exper. Biol. and Med., 90 (3): 664-666. Dec. 1955. DLC (QP1.S8, v. 90)

The hypoxic threshold, or pressure at which ventilation began to increase during breathing of 50% O_2 in N_2, was found to be 179 mm. Hg tracheal O_2 pressure in subjects acclimatized to an altitude of 14,150 ft., and 127 mm. in subjects acclimatized to 5300 ft. The threshold in subjects living at sea level has been found to be 93 mm. Ingestion by 5300 ft.-acclimatized subjects of 6 gm. of NH_4Cl/day for 5 days prior to the experiment (acidosis) increased the threshold to 164 mm., while the ingestion of 15-30 gm. $NaHCO_3$/day for 5 days (alkalosis) decreased the threshold to 107 mm. Since NH_4Cl could be expected to counteract the effects of altitude on alveolar O_2 tension and pH, but nevertheless changed the threshold in the direction of increased altitude, these factors were discounted as determinants of the threshold. It is suggested that the threshold is determined by the CO_2 or bicarbonate level to which the subject is acclimatized.

4781
Pezzi, R.
[BEHAVIOR OF THE NUMBER OF ERYTHROCYTES DURING PROGRESSIVE ASCENSION AND LONG STAY AT HIGH ALTITUDE] Comportamento del numero di globuli rossi durante ascensioni progressive e lunga permanenza ad alta quota. — Rivista di medicina aeronautica (Roma), 18 (2): 358-372. April-June 1955. In Italian, with English summary (p. 370) DLC (TL555.A1R5, v. 18)

An increase of erythrocytes (43%) and hemoglobin (38.59%) was demonstrated by rats subjected to progressive ascension and final exposure to a simulated altitude of 7500 meters in a decompression chamber for 12 days. No additional significant increase was noted during the experiment and this was attributed to the degree of acclimatization at high altitude which was obtained during progressive ascension.

4782 1952
Phillips, P. B.
AVIATION NEUROPSYCHIATRY IN THE UNITED STATES NAVY. — Contact (Pensacola), 10 (1): 36-45. Jan. 1952. DNLM

The psychiatric aspect is discussed of the Naval flight surgeon's responsibility in selection, training, and maintenance of aviators. During selection he is responsible for the development and validation of printed tests of psychomotor function and for conducting personal interviews. His role is considered in evaluating the motivation of candidates during selection and in the training period as well as in handling the stresses of fear, frustration, and fatigue which affect the flyer's fitness.

4783
Phillips, P. B.
NEUROPSYCHIATRY IN RELATION TO AVIATION MEDICINE. — In: Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 163-190. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

A brief outline is presented of the course given by the Department of Neuropsychiatry in the Naval School of Aviation Medicine, Pensacola, Fla. Certain psychoanalytic concepts and the psychobiological point of view are related as they are applicable in the work of the naval flight surgeon. From the resident course of lectures and seminars subjects are presented for the information of medical officers who are not themselves engaged in the practice of psychiatry. Also included is a sample examination for the student officer's practice. (59 references)

4784
Phillips, R. B.,
and C. C. Dugan
AIRCRAFT ACCIDENTS WITH HAPPY LANDINGS [Abstract]. — Tactical Air Command Surgeon's Bulletin, 5 (6): 6. June 1955. DNLM

Seventeen per cent of all major aircraft accidents are fatal, with an average of 2.5 deaths per fatal accident. One half (3178) of all deaths in the U. S. Air Force in 1953 were caused by aircraft accidents. In flying personnel aircraft accident deaths are 25 times more frequent than deaths from other causes, and amount to 1 per 1000 per year.

4785
Philmus, L. C.
JET NOISES IMPAIR HEALTH, SAYS SCHOOL OF AVIATION MEDICINE. — Amer. Aviation, 18 (21): 30. March 14, 1955. DLC (TL501.A675, v. 18)

The danger of hearing impairment through exposure to jet noise is discussed. Measures taken by the Air Force to prevent noise-induced damage are briefly described, including the use of ear defenders, administration of weekly hearing tests, rotation of personnel, display of written warnings, and removal and elimination of noise sources.

4786
Phipps, L. W.,
E. T. Renbourn, and P. F. Taylor
THE MEASUREMENT OF RELATIVE HUMIDITY AND VAPOUR PRESSURE NEAR THE SKIN [Abstract]. — Jour. Physiol. (London), 127 (3): 46P-48P. March 28, 1955. DLC (QP1.J75, v. 127)

The development of a humidity-sensitive film for the measurement of vapor pressure near the skin surface is described. The electrical resistance of the film, which is composed of a mixture of partially hydrolyzed polyvinyl alcohol and lithium chloride solution, is a function of relative humidity and temperature. With the attachment of a thermocouple for the measurement of temperature, vapor pressure may be estimated. Observations made with the apparatus indicate that water vapor flow is a function of the ratio $\frac{\text{water vapour pressure}}{\sqrt{\text{absolute temperature}}}$.

4787
Phoebus, C. P.
THE HIGH INTENSITY NOISE PROBLEM IN THE U. S. NAVY. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 117-121. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no.6)

Same as item no. 1935, vol. II.

4788
PHYSICAL STANDARDS AND FLYING SAFETY. — U. S. Air Force Medical Service Digest, 6 (7): 23-24. July 1955. DLC

This is a letter written by the Surgeon General expressing the basic relationship of medical standards for pilots to aviation safety and the policy of the U. S. Air Force in grounding pilots for physical reasons.

4789
PHYSIOLOGICAL AND PSYCHOLOGICAL REACTIONS. — Flying, 56 (5): 37-38. May 1955. DLC (TL501.P6, v. 56)

A brief discussion is presented of the physiological and psychological reactions experienced by a pilot in instrument flight which can seriously detract from, or even nullify, the best of procedures and technique. Included reactions are: (1) illusions caused by partially blocked vision; (2) disturbed equilibrium and orientation related to the inner ear mechanism; (3) combined sensations of pressure or tension of the skin, muscles, joints, tendons, and viscera causing deep sensibility; (3) hearing disturbance; (4) dizziness; (5) hypnosis caused by the lack of natural outside vision, or gazing at one instrument to the neglect of others; (6) fear, which may cause panic; and (7) conflict with instrument indications brought about by either sensation or emotion. The pilot should totally disregard all such reactions, other than belief in the instrument indications as seen through the eye, but must not incapacitate himself in doing this through tension of mind or body.

4790
PHYSIOLOGICAL TRAINING. — U. S. Air Force Medical Service Digest, 6 (11): 2-4, Nov. 1955. DLC

The U. S. Air Force physiological training program was originally established for high-altitude indoctrination of aviation cadets, and for detection of latent physiological or psychological conditions which may interfere with flight training. Demobilization after World War II and difficulties in obtaining qualified personnel to serve as aviation physiologists led to training of pilots and Medical Service Corps officers to do altitude indoctrination. At the present the Physiological Training Program operates 44 physiological training units, 13 ejection seat trainers, 19 night vision trainers, and employs 537 airmen and 92 physiological training officers.

4791
PHYSIOLOGICAL TRAINING PROGRAM AT FIELD TRAINING UNITS. — U. S. Air Force Medical Service Digest, 6 (11): 5-8. Nov. 1955. DLC

The various phases of the Physiological Training Program are described as conducted by different U. S. Air Force physiological training units in the United States and at overseas bases. The lectures acquaint the airmen with the physiological hazards of flight including hypoxia, decompression sickness, acceleration and g forces, and the procedures for protection against the stresses encountered at altitude and during high-speed maneuvers. Application of the survival principles and procedures is demonstrated in simulated flights, i.e. ascent to altitude in the low-pressure chamber. Further the curriculum includes the study of night vision,

emergency escape procedures, physiological problems encountered in high-speed flight, the use of an ejection-seat trainer, and indoctrination in the use of a partial-pressure suit. Refresher training is given to rated personnel at least once every three years.

4792
Picard,
Laboureur, and Navaranne
[ELECTRO-ENCEPHALOGRAPHIC EXAMINATION OF FLYING PERSONNEL] Examen électro-encéphalographique du personnel navigant. — Médecine aéronautique (Paris), 10 (1): 53-58. 1955. In French. DLC (TL555.M394, v. 10)

Electroencephalographic examinations of pilots involved in aerial accidents have shown abnormal traces indicative of cerebral disturbances typical of shock or epilepsy. Pilot candidates were examined to determine whether these abnormalities were correlated with personality characteristics common to pilots. Electroencephalograms of 45% of these subjects showed an abnormal pattern at rest, consisting of a predominant theta rhythm in the middle region, and slow delta waves partially masked by the alpha rhythm in the occipital region. In further stuides, based on psychological tests and clinical examination, this pattern was found to be present chiefly among subjects characterized by enthusiasm, aggressiveness, and contempt for danger, indicative of egocentrism and emotional immaturity. It is questioned whether these characteristics, undoubtedly suitable for combat flying, are conducive to air safety.

4793
Pichitino, A. M., 1952
W. H. Deily, and I. Glassman
A DYNAMIC AIRCRAFT SIMULATOR FOR STUDY OF HUMAN FREQUENCY RESPONSE CHARACTERISTICS [Abstract]. — In: Airborne Electronics, 1952 (National Conference on Airborne Electronics, Dayton, Ohio, 1952), p. 127. DLC (TL693.A3, 1952)

The structure of a dynamic jet aircraft simulator is described. The simulator is intended for psychological experiments investigating the parameters of the human frequency response in flight.

4794
Pichotka, J.,
O. Creutzfeldt, and W. Höfler
[THE SHIFTS OF BODY TEMPERATURE AND OXYGEN UPTAKE IN ANOXIA IN PRESENCE OF VARYING HEAT LOSS] Die Bewegungen der Körpertemperatur und der Sauerstoffaufnahme bei veränderlicher Wärmeabgabe im Sauerstoffmangel.— Naunyn-Schmiedebergs Archiv für experimentelle Pathologie und Pharmakologie (Berlin), 225 (4): 335-341, 1955. In German. DNLM

Experiments were conducted with guinea pigs to investigate the influence of changing environmental temperature (15° to 30° C.) on the shifts of body temperature and oxygen uptake in hypoxia (7% O_2). A fall in the ambient temperature produces an immediate fall of the rectal temperature simultaneous with an increase of oxygen uptake. Raising the ambient temperature results in the reversed behavior. In each case the oxygen uptake and body temperature shifts are in an inverse relationship to each other. This correlation persists regardless of whether the change occurs in the oxygen uptake due to altered oxygen tension or whether it occurs in the body temperature due to heat loss.

4795
Pichotka, J.,
O. Creutzfeldt, and W. Höfler
[THE CHANGES OF BODY TEMPERATURE AND OXYGEN UPTAKE DURING ALTERNATION BETWEEN NORMAL AND LOWERED OXYGEN TENSIONS] Die Bewegungen von Körpertemperatur und Sauerstoffaufnahme beim Wechsel zwischen normalen und erniedrigten Sauerstoffspannungen. — Naunyn-Schmiedebergs Archiv für experimentelle Pathologie und Pharmakologie (Berlin), 225 (4): 323-334. 1955. In German. DNLM

Experiments were conducted with guinea pigs to examine the shifts in oxygen uptake and the rectal temperature during (a) transfer from normal oxygen tension to lowered oxygen tension (8% O_2), and (b) return to normal O_2 tension. Reduction of the oxygen tension led to extreme fall in the oxygen uptake which then rose gradually to a plateau within 50 to 100 min. A return to normal oxygen tension at first doubled the oxygen uptake, which then receded to normal values. These shifts in oxygen uptake occurred simultaneously with changes in the rectal temperature. The increase of oxygen uptake during lowered oxygen tension is accompanied by a fall in the rectal temperature which stabilizes at a constant value at the same time as the oxygen uptake. A return to normal oxygen tension reverses this behavior. The shifts in oxygen uptake regardless of oxygen tension are seen as part of a regulatory mechanism. (From the authors' summary)

4796
Pichotka, J.,
O. Creutzfeldt, and W. Höfler
[THE BEHAVIOR OF THE BODY TEMPERATURE IN ANOXIA] Das Verhalten der Körpertemperatur im Sauerstoffmangel. — Naunyn-Schmiedelbergs Archiv für experimentelle Pathologie und Pharmakologie (Berlin), 225 (4): 314-322. 1955. In German. DNLM

A close relationship was shown in 130 measurements on guinea pigs between the oxygen tension of the inspired air and the body temperature. A fall in the O_2 tension evokes at first an increase of the rectal temperature by 0.5-1.0° C. at an O_2 tension of approximately 100 mm. Hg. A further reduction of the O_2 tension is accompanied by a logarithmic fall of the rectal temperature, which eventually stabilizes at a lower level. The decrease in body temperature is proportional to reduction of O_2 tension in the atmosphere. The lowest constant temperatures observed under these conditions were slightly above 34° C. at O_2 tensions of 40 mm. Hg (10,000 m. altitude). (From the authors' summary)

4797
Pickett, J. M.,
and K. D. Kryter
PREDICTION OF SPEECH INTELLIGIBILITY IN NOISE. — Air Force Cambridge Research Center.

Operational Applications Lab., Bolling Air Force Base, Washington, D. C. Report no. AFCRC-TR-55-4, June 1955. iii+20 p. AD 69 350 PB 118447

A study was undertaken to measure the intelligibility of speech in a variety of noise conditions, to compare these data with expected scores computed by each of several prediction methods, and to develop a new method for predicting the results of intelligibility tests from acoustical measurements. In general the results show that the articulation index (average of specified octave band sound-pressure levels) calculated according to Beranek's version of the Bell Telephone Labs' method underestimates word and sentence intelligibility in low-frequency noise but overestimates intelligibility in high-frequency noise. The method of French and Steinberg was similar to Beranek's method. The Strasberg method overestimated the masking effectiveness of low-frequency noise and underestimated that of high-frequency noise. The Beranek method satisfactorily predicted word intelligibility when the criterion sound/noise was raised from 10 to 13 db. A new method of prediction is discussed which attempts to preserve the simplicity of the octave-band procedure and to overcome some of its limitations. (AD abstract, modified)

4798
Picon, A.
[ACCIDENTS IN CIVIL AVIATION] Accidentes de aviación civil. — Revista nacional de aeronáutica (Buenos Aires), 15 (162): 55-56; 83. Sept. 1955. In Spanish. DLC (TL504.R547, v. 15)

Accidents in civil aviation may be attributed to human factors (71%) and to other causes (29%). A statistical classification of accident causes attributes the main one to the pilot's (1) faulty operation of the aircraft as a result of poor skill, experience and coordination (40%), and (2) to an error in judgement, the ability to make a correct decision in accordance with the circumstances in relation to previous experience and instruction (11%). Other factors include: (3) carelessness (8.3%), negligence (2.7%), and indiscretion (7.5%) by the pilot; (4) psychophysiological factors (1.3%); (5) faulty maintenance (5.5%), errors committed by persons entrusted with aircraft maintenance, service, and inspection; (6) faulty construction of the plane or protective equipment (6.8%); (7) meteorological conditions (1%); (8) ground conditions (10.4%); (9) unexpected factors (0.5%); and (9) other reasons (4.5%).

4799
Pierach, A.
[NIGHT WORK AND SHIFT CHANGES IN HEALTHY AND SICK PEOPLE] Nachtarbeit und Schichtwechsel beim gesunden und kranken Menschen. — Acta medica scandinavica (Stockholm), Suppl. 307: 159-166. 1955. In German. DNLM

Statistical studies of occupational diseases are reviewed for industrial and transport workers who work frequently on night shifts. Experimental work on the effects of and adaptation to inversion of the diurnal rhythm is cited. In these occupations the incidence of gastrointestinal disorders (ulcers, gastritis), cardiovascular diseases, particularly myocardial infarcts, hyperthyroidal symptoms, chronic fatigue, and in the later years incipient sclerosis (cerebral arteriosclerosis) exceeds that of the normal population. The significance of these statistics is discussed in the light of Selye's stress concept, the stress being most severe in occupations with frequent changes in shifts. Wide differences were observed in the individual ability to adapt to day-night inversion.

4800
Pietrasanta, A. C.,
and R. H. Bolt
BASIC FACTS ABOUT NOISE AS RELATED TO AVIATION. — SAE Transactions, 63: 265-274. 1955. DLC (TL1.S6, v. 63)

A technical discussion of basic concepts of noise and noise problems includes brief consideration of the physical characterization of noise, its measurement, properties of a noise source (particularly jet aircraft), the propagation of noise, the effects of noise on man, noise control, and adaptive phenomena.

4801
Pillero, S. J.
THE EFFECTS OF LOW PRESSURE ON HEMOPOIESIS IN THE ADRENALECTOMIZED RAT. — Endocrinol., 57 (6): 676-682. Dec. 1955. DLC (QP187.A25, v. 57)

The response of red blood cell, hemoglobin, hematocrit, and reticulocyte values to 4-hour daily exposures for 14 to 21 days to a simulated altitude of 20,000 feet was similar in sham-operated and adrenalectomized rats. Bone marrow response was similar in the two groups after 21 days of exposure. After a 3-week recovery period, however, an increase in the number of granulocytes and a decrease in the humber of nucleated erythroid cells were observed in adrenalectomized rats. Although adrenalectomy alters the red-cell production mechanism, the adrenal is not considered to be essential in the hemopoietic response to low pressure.

4802
Pippitt, R. G.,
A. H. Taylor, and H. C. Dyme
CANNED PREFRIED BACON FOR FLIGHT FEEDING. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-214, Dec. 1955. iv+3 p. (Project no. 7156). AD 97 634 UNCLASSIFIED

Prefried, canned bacon is a very palatable food item and retains its high acceptability when consumed aloft. It is well suited for use in the sandwich snack. However, only crew members should be provided with sandwiches prepared with canned bacon when these sandwiches are prepared in flight. The time required for preparation in flight is too great to conveniently feed a large group of passengers. Sandwiches are usually prepared in a flight kitchen, so this problem is relatively unimportant. Prefried bacon should be made a standard subsistence item when it is produced in quantity by industry. High cost presently prohibits procurement of small quantities solely for military use. (Authors' conclusions)

4803
Placidi, T.,
and R. Flandrois

[ILLNESSES IN FLIGHT] Les malaises en vol. — Médecine aéronautique (Paris), 10 (3): 201-216. 1955. In French. DLC (TL555.M394, v. 10)

A description of the illnesses which may be encountered in flight is derived from medical records of the French Air Force for 1951-1954. The illnesses, resulting chiefly in dystonia and fainting, may be caused by anoxia (usually from a defective mask), decompression, hypoglycemia, or by digestive, cardiac, sensory, or psychic disturbances. Personnel are predisposed to this type of accident by lack of training, poor meal schedules, and digestive, nervous, or psychic instability. The conditions of flight, including altitude, acceleration, ambient heat, anxiety, and pressure breathing, may aggravate these existing weaknesses.

4804
Placidi, T.,
and F. Postic
[SURVIVAL RATION FOR PERSONNEL IN DISTRESS] Ration de survie pour équipages en détresse. — Médecine aéronautique (Paris), 10 (2): 129-138. 1955. In French. DLC (TL555.M394, v. 10)

The development of the survival ration now in use by the French Air Force in desert regions is discussed. Initial attempts to provide a satisfactory survival ration in 1948 and 1950 failed because the ration was found in the first case to increase thirst, and in the second case to be too heavy. In 1953, a diet composed of various experimental substances was tested, and two rations (J and MB) were chosen for adoption as the standard. Substance J was later eliminated because of difficulties of preservation. The present ration, consisting of substance MB supplemented by bouillon, salt, etc., provides approximately 2400 calories for three days. The composition of the ration is discussed.

4805
Placidi, T.,
and R. Biojout
[PSYCHOLOGICAL SELECTION OF FLYING PERSONNEL] La selection psychologique du personnel navigant. — Forces aériennes françaises (Paris), no. 105: 1067-1080. June 1955. In French. DLC (UG635.F8F66, v. 1955)

The examination for the selection of student pilots in the French Air Force is based on the written and psychomotor tests used in the United States in 1943-1944. The examination includes written tests of general information, biography, judgment, orientation, and instrument and chart reading, and psychomotor tests of complex coordination, directional coordination, and circular pursuit. The examination is scored according to grades of 1 to 9, with 5 being the mean. The elimination of candidates with scores of 1, 2, or 3 has lowered the failure rate of student pilots from 61 to 36%. The examination is continually adjusted according to analyses of the relative success of students in pilot school and their scores on the examination. Flexibility in the selection of students by the addition of psychological tests and personal interviews is suggested.

4806
Placidi, T.,
and Postic
[TOXICITY OF EXTINGUISHING AGENTS USED AGAINST AIRPLANE FIRES ON THE GROUND] Toxicité des agents extincteurs utilisés dans la lutte contre l'incendie des avions au sol. — Forces aériennes françaises (Paris), 1955 (109): 779-790. Nov. 1955. In French. DLC (UG625.F8F66, v. 1955)

Several halogenated derivatives of saturated aliphatic hydrocarbons developed for the extinguishing of fires of combustible liquids have been tested for toxicity by chemical analysis and animal experiment. The effectiveness of a hydrocarbon as an extinguisher has been found to increase as the weight of the constituent halogen increases. For practical reasons, however, bromine and chlorine are generally used rather than iodine. The addition of fluorine to an already halogenated compound increases its effectiveness and decreases its toxicity.

4807
Plas, F.,
and J. Curveillé
[PRACTICAL SIGNIFICANCE OF THE KNOWLEDGE OF TRANSITORY ELECTROCARDIOGRAPHIC VARIATIONS ASSOCIATED WITH A STATE OF FAILURE] Intérêt pratique de la connaissance d'altérations électrocardiographiques passagères liées à un état de fatigue. — Médecine aéronautique (Paris), 10 (4): 481-489. 1955. In French. DLC (TL555.M394, v. 10)

The cases of two subjects recording abnormal electrocardiograms of type III are described. The abnormality was accredited in the first case to hypertension caused by psychosomatic shock, and in the second case to fatigue caused by rigorous athletic training accompanied by insufficient nutrition (hypoglycemia). The abnormalities were completely transitory, disappearing after rest and, in the second case, after proper nutrition. Caution in the testing of cardiac function is therefore indicated to ensure that such variations not be mistaken for permanent incapacity.

4808
Platzer, H. L.
A NON-LINEAR APPROACH TO HUMAN TRACKING. — Franklin Inst., Philadelphia, Pa. (Contract Nonr-1571(00)); issued by Office of Naval Research, Washington, D. C. Interim Technical Report no. I-2490-1, Dec. 21, 1955. v+32 p. (Project NR 145-099). AD 83 668 PB 124680

The phase-plane was used to study reponse characteristics of the human operator in tracking problems since it presents the operator with additional information by providing the error-rate as well as error information. With the division of the phase-plane, tracking performance is improved over the performance with conventional error display. The disadvantage of the phase-plane display is that it is two-dimensional. The θ-display was developed to overcome this disadvantage. It contains most of the information contained in the phase-plane display including its optimum switching properties, and has the advantage of being one-dimensional. The sampled θ-display was used to study the essential role played by velocity information in tracking. (Author's abstract, modified)

4809
Polezhaeva-Shifman, A. S.

[EFFECT OF ENVIRONMENTAL TEMPERATURE AND OF DIFFERENT QUANTITIES OF DIETARY PROTEIN ON BODY WEIGHT AND ON CERTAIN INDICES OF LIVER METABOLISM IN RELATION TO THE PROBLEM OF OPTIMAL PROTEIN CONTENT OF FOOD] Vliîanie temperatury vneshneĭ sredy i razlichnykh kolichestv belka v pishche na ves tele i nekotorye pokazateli obmena veshchestv pecheni i svîâzi s problemoĭ optimal'nogo soderzhanniîâ belka v ratsione. — Biokhimiîâ (Moskva), 20 (1): 57-65. Jan.-Feb. 1955. In Russian, with English summary (p. 66) DLC (QH301.A343, v. 20)

Rats were starved for short periods of time, and some of the protein indices of the organism were studied. Animals were kept at different temperatures and were fed different rations. At high temperatures the protein optimum corresponded to a ration containing 20% casein. Protein intake above the optimum, e. g., 40% casein, served no useful purpose; it retarded gain in weight and liver nitrogen storage. Rations of low protein content significantly lowered the glutathione and xantheneoxidase activity in the liver, independent of high temperatures; they also retarded gain in weight and liver nitrogen accumulation. Under low-temperature conditions the protein optimum rose to correspond to a diet containing 40% casein. Determination of the organism's protein requirements should be based on a complex picture of physiological indices, of which liver xantheneoxidase may be regarded as among the most significant.

4810
Pollack, I.
MASKING BY A PERIODICALLY INTERRUPTED NOISE. — Jour. Acoust. Soc. Amer., 27 (2): 353-355. March 1955. DLC (QC221.A4, v. 27)

Experiments were conducted to determine the effects of burst-repetition rate and burst-time fraction on the masked threshold of a 1000-cycle tone, and the effects of burst repetition rate and inter-burst ratio on speech intelligibility. Curves constructed from results of the experiment indicate that the masked threshold associated with an intermittent noise can be closely described by two functions: (1) the masking produced by an interrupted noise with silent intervals between successive noise bursts, the level of which is primarily dependent on the length of the interval, and (2) the masking produced by a continuous uninterrupted noise at the inter-burst level.

4811
Pollack, I.
SOUND LEVEL DISCRIMINATION AND VARIATION OF REFERENCE TESTING CONDITIONS. — Jour. Acoust. Soc. Amer., 27 (3): 474-480. May 1955. DLC (QC221.A4, v. 27)

The accuracy of discrimination of small changes in sound level was examined as a function of the magnitude, time, and dimensions of the variation between two reference testing conditions. Precision of sound-level discrimination declined as the magnitude of the sound level difference between the two reference conditions increased and as the frequency of occurrence of shifting between the two reference conditions increased. Of lesser importance was the temporal interval between successive discriminations, variation in the audio-frequency of the reference signals, and the predictability of the to-be-presented testing conditions. The results may be considered in terms of a psychological shift in the effective standard through the averaging of the entire complex of presented stimulus conditions. This effect is apparently limited to one stimulus dimension for small variabilities, but may be transferred to other dimensions by large variabilities. The effect evidently cannot be controlled by the subject, since even predicted variabilities affect performance. (Author's abstract, modified)

4812
Pollack, I.
VISUAL NOISE FILTERING BY HUMAN OPERATORS. I. SEQUENTIALLY ENCODED INFORMATION. — Operational Applications Lab., Air Force Cambridge Research Center, Washington, D. C. Report no. AFCRC-TR-54-57, Jan. 1955. x+32 p. AD 64 490 UNCLASSIFIED

Orderly sequences of dots, arranged as discrete approximations to continuous "flight paths", were perturbed randomly and were presented to experimental subjects. The task of the subjects was to recover the original flight path, either by reproducing the best estimate of the original path or by matching the best estimate of the path to one of a restricted number of paths. The major findings were: (1) filtering performance deteriorates as the proportion of signal positions subjected to random perturbations is increased. The change in filtering performance is, however, not necessarily uniform with increasing perturbation. Sharp changes in filtering performance may be obtained over a critical range of perturbation levels. The region of these sharp changes is, in turn, a function of the difficulty of the filtering task. (2) Filtering performance deteriorates as the time available for inspecting the composite signal decreases. And (3) within the limits investigated, the amount of information processed by the subject, relative to the information presented, is approximately independent of the number of possible paths available to the subject for matching. (From the author's summary)

4813
Poos, E. E.
FUNCTIONAL DISTURBANCES OF THE EAR, NOSE, AND THROAT IN AIRMEN. — Jour. Aviation Med., 26 (1): 61-64. Feb. 1955. DLC (RC1050.A36, v. 26)

In many pilots with functional disturbances of the ear, nose and throat, an underlying emotional conflict may be the cause. Such patients may also develop organic disease conditions which add to their worries. In each instance, a thorough history and physical examination are essential. Every effort must be made to gain an insight into the patient's emotional life in order to effect a cure. (Author's summary)

4814
Popova, T. V.
[INTEROCEPTIVE REFLEXES IN DOGS IN HYPOXEMIA] Interotseptivnye refleksy u sobak pri gipoksimii. — Bîulleten' eksperimental'noĭ biologii i medifsiny (Moskva), 39 (6): 32-36. June 1955. In Russian. DLC (R91.B56, v. 39)

Dogs inhaled air mixtures containing 6-12% oxy-

gen, which corresponded to an altitude of 4500-9500 m. This treatment brought about two-phase interoceptive reflex changes at all hypoxemic conditions: a considerable increase in the reflex reaction during the first phase, followed by a weakening in or complete suppression of reflex reaction in the second phase. The increase in the interoceptive reflexes during the first phase was accompanied by a fall in the stimulation threshold and by clearly defined pressor reflexes at the sub-threshold level of stimulation. The transition to the second phase, as shown by gasometric studies, was not connected with any substantial fall in the blood oxygen saturation. Return to atmospheric pressure normalized all interoceptive reflex manifestation. It was concluded that in acute and chronic hypoxia the principles which regulate the course of interoceptive reflex manifestations are essentially the same.

4815
Popović, V.
[PROLONGED LETHARGIC HYPOTHERMIA] De l'hypothermie léthargique prolongée. — Archives des sciences physiologiques (Paris), 9 (4): C219-C227; discussion, p. C227-C229. 1955. In French. DNLM

Experiments were conducted to determine the cause of death in prolonged stable hypothermia in rats. Correlations were established bwtween depth of hypothermia, survival time during hypothermia, and duration of hypothermia in which resuscitation by rewarming could be successfully accomplished. The time required for thermogenetic rewarming was directly dependent on the duration of hypothermia. Oxygen consumption was maintained at a greatly reduced level during the first hours of hypothermia; a gradual decrease with extended hypothermia preceded the occurrence of death. Prolonged hypothermia produced a progressive hypoglycemia after an initial hyperglycemia, increases in blood urea, plasma inorganic phosphorous, number of erythrocytes, blood concentration, and coagulation time, and, after an initial decline, an increase in the number of leucocytes. Cardiac frequency was decreased as a function of the duration of hypothermia. No instances of ventricular fibrillation were observed. Death was attributed to the basic physiologic instability produced by prolonged hypothermia.

4816
Poulton, E. C.,
and S. S. Stevens
ON THE HALVING AND DOUBLING OF THE LOUDNESS OF WHITE NOISE. — Jour. Acoust. Soc. Amer., 27 (2): 329-331. March 1955. DLC (QC221.A4, v. 27)

The decibel changes required to halve and to double the apparent loudness of a white noise were determined at nine sound pressure levels by 36 subjects. The subjects adjusted the level of the noise by means of an improved control—a "sone potentiometer" whose angular turn is roughly proportional to the loudness produced. An attempt was also made to measure and control some of the biasing factors that affect loudness estimations. Results: the median decibel changes required to produce a 2:1 loudness ratio ranged from 6 to 10 db. approximately. (Authors' summary)

4817
Pratt, A. J.,
Dietrich C. Smith, and F. P. Ferguson
ROLE OF THE ADRENAL GLAND IN THE RESPONSE OF PLASMA POTASSIUM OF THE RAT TO MODERATE AND SEVERE HYPOXIA. — Endocrinol., 57 (4): 450-455. Oct. 1955. DLC (QP187.A25, v. 57)

Rats decompressed to simulated altitudes of 25,000 to 35,000 feet for 30 minutes show a reduction in plasma potassium concentration (up to 22%). No change in the plasma potassium concentration takes place in adrenalectomized rats after decompression to 30,000 feet for 30 minutes. Administration of adrenalin to the adrenalectomized rat reduces the plasma potassium level; decompression of these animals produces no further reduction in potassium levels. If either intact or adrenalectomized rats are exposed to an altitude of 40,000 feet until respiratory collapse occurs, the plasma potassium concentration rises significantly. It is clear that the adrenal medulla is implicated in the changes in plasma potassium which occur during moderate decompression, but not in the changes of severe decompression.

4818
Preber, L.
[ON VARIOUS METHODS OF TESTING A PERSON'S SENSITIVITY TO MOTION SICKNESS] Om olika metoder att pröva en persons känslighet för rörelsesjuka (motion sickness). — Medellanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (2): 10-12. 1955. In Swedish. DNLM

This is a report on studies at the Söder Hospital of nausea reactions evoked by caloric and rotatory vestibular examinations of patients sensitive to motion. Changes in skin resistance brought about by vestibular stimulation were recorded simultaneously graphically (with a photo-electric recorder) to determine vegetative reactions. A sample recording is reproduced: during the stimulation or nystagmus phase a slight lowering of skin resistance may occur; a few minutes after the beginning of the stimulation a considerable lowering may occur in neuro-vegetatively sensitive individuals. The changes in skin resistance follow the course of the nausea reaction. This method could be modified profitably for testing a person's sensitivity to motion sickness.

4819
Precht, H.,
J. Christophersen, and H. Hensel
[TEMPERATURE AND LIFE] Temperatur und Leben. — Berlin: Springer-Verlag, 1955. xii+514 p. In German. DNLM

A comprehensive discussion is presented of the role of temperature in the biological and chemical processes of poikilothermal animals and plants, microorganisms, and warm-blooded animals. Topics considered include the physiology of acclimatization to environmental heat and cold, the relation between temperature and cell growth, the phenomena of hypothermia, hyperthermia, and hibernation, the temperature resistivity of microorganisms and enzymes, the mechanism of body heat regulations, and the effect of temperature on chemical reaction time.

4820
PRELIMINARY REPORT ON A SUBSTANTIATED SUPERSONIC EJECTION. — Tactical Air Command Surgeon's Bull., 5 (5): 6-10. May 1955. DNLM

This report deals with injuries sustained by a test pilot during ejection from an aircraft in a vertical dive at 6500 feet altitude and at a speed of Mach 1.05. The severity of injuries produced by strong decelerative forces, wind blast, and tumbling, indicate the probable fatality of similar accidents in the absence of immediate medical attention.

4821
Přerovský, I., J. Linhart, and Z. Fejfar
REFLEX ADJUSTMENT OF THE PERIPHERAL CIRCULATION IN MAN. I. THE ROLE PLAYED BY THE VEINS IN THE REGULATION OF BLOOD FLOW THROUGH SKIN AND MUSCLE. — Physiologia bohemoslovenica (Praha), 4 (4): 389-396. 1955. In English. DLC (QP1.C417, v. 4)

Raising of venous pressure in the upper limb of man caused by constriction of the arm with a sphygmomanometer cuff causes reflex vasodilatation in the muscles of the fore-arm and in the large arteries together with vasoconstriction in the skin of the fingers. This reflex arises in the venous bed. (From the authors' summary)

4822
Preston-Thomas, H., R. Edelberg, J. P. Henry, J. Miller, E. W. Salzman, and G. D. Zuidema
HUMAN TOLERANCE TO MULTISTAGE ROCKET ACCELERATION CURVES. — Jour. Aviation Med., 26 (5): 390-398. Oct. 1955. DLC (RC1050.A36, v. 26)

Hyperbolic acceleration curves are derived for 3 or 4 stage rockets which could attain the 10 to 11 km./sec. velocity necessary for establishment in a practical orbit around the earth. A preliminary study has evaluated the capacity of 9 subjects to perform a dual pursuit task while undergoing a typical series of curves. Evidence is presented to indicate that select crewmen can be expected to assist in the control of such a vehicle during the critical acceleration phases of the flight. (Authors' summary)

4823
Priest, J. P.
RESEARCH IN CIVIL AVIATION MEDICINE. — Congressional Record, 101 (4): 4760-4761. April 4-May 4, 1955. DLC (J11.R5, v. 101)

The goals, problems, and organization of research in aviation medicine are discussed in an address originally delivered before the Civil Aviation Medicine Association. The establishment of an Institute of Civil Aviation Medicine is recommended.

4824
PROBLEMS IN CREW COORDINATION. — Skyways, 14 (9): 16-19, 34-37. Sept. 1955. DLC (TL501.S634, v. 14)

Division of duties, cockpit discipline, and sound team training are cited in a round-table discussion as chief factors in the development of cockpit crew coordination. The question of the right of the copilot to overrule the captain in emergency situations is also discussed.

4825
PROFESSIONAL SERVICE. — U. S. Air Force Medical Service Digest, 5 (7): 3-8. July 1955. DLC

A discussion is presented of the organizational structure, functions, and accomplishments of the professional services of the U. S. Air Force Medical Service, including the Aviation Medicine Division, Aviation Physiology Program, the Technical Information Branch, the Physical Standards Division, the Consultants Group, and the Preventive Medicine Division.

4826
PRONE. — U. S. Naval Aero-medical Safety Jour., 1 (3): 15-16. Nov. 1955. DNLM

Flight surgeons are encouraged to consider repetition of accidents in pilots a result of conditions of exposure rather than of a stable individual response characteristic of "accident proneness".

4827
PROPERTIES OF EAR PROTECTORS OR AURAL PROTECTIVE DEVICES. — U. S. Air Force Medical Service Digest, 6 (5): 7-10. May 1955. DLC

Three general types of aural protective devices that attenuate air-borne noise are: (1) insert type, (2) cushion or doughnut types, and (3) helmet type. Attenuation ranges between 15-25 decibels at 100 c.p.s. to 30-40 db. at high frequencies for plugs and cushion-type defenders. Higher attenuation can be provided only by the helmet-type defender or a combination of plug and cushion cover. Practical problems considered are: (1) selection of the proper size in view of wide differences in the diameter of the ear canal, (2) maximum comfort and protection, (3) a program of distribution, and (4) the care and upkeep of protectors.

4828
Proust, R.
[NUTRITION OF FLYING PERSONNEL IN THE TROPICS] L'alimentation du personnel navigant en pays tropical. — Forces aériennes françaises (Paris), no. 106: 181-194. July 1955. In French. DLC (UG635.F8F66, v. 1955)

Proper regulation of the diet requires a knowledge of the total energy needs and specific nutritive requirements of the body, and of the nutritive and caloric value of specific foods. In tropical environments the total caloric value of the diet may be reduced 5-10%. Protein requirements remain unchanged, while fat content may be reduced 30%, and carbohydrate, water, salt, and vitamin B_1 intake increased. Alcohol should be consumed only in the evening.

4829
Provins, K. A.
MAXIMUM FORCES EXERTED ABOUT THE ELBOW AND SHOULDER JOINTS ON EACH SIDE

SEPARATELY AND SIMULTANEOUSLY. — Jour. Applied Physiol., 7 (4): 390-392. Jan. 1955. DLC (QP1.J72, v. 7)

Twelve subjects were tested for maximum isometric force exertable about the shoulder joint and about the elbow joint in two different seated positions. Strength of attempted movement was recorded for both sides separately and simultaneously in a cooperative action. Strength of extension at the elbow was approximately 73% of strength of flexion; at the shoulder 119% of flexion. The summed torques exerted by the two hands separately gave values of about 96% and 107% of that for the elbow and shoulder series respectively. (Author's summary, modified)

4830

Psychological Research Associates Corp.

VISUAL SENSITOMETER. — Psychological Research Associates Corp., N. Y. (Contract AF 30 (602)-1236). Final Engineering Report, April 7, 1955. 8+3 p. AD 67 046 PB 126835

A description, including drawings, is presented of a Visual Sensitometer designed to provide an increment luminous test stimulus in the center of a circular field. (Author's abstract)

4831

Puccio, V.

[ABSOLUTE ORIENTATION IN SPACE: EFFECT OF MODERATE HYPOXIA ON THE EVALUATION OF POSITIONS IN SPACE, REACHED BY MEANS OF PASSIVE BODY DISPLACEMENT] Orientazione assoluta nello spazio. Azione dell' ipossia di modico grado sulla valutazione delle posizioni nello spazio raggiunte mediante spostamento passivo del corpo. — Rivista di medicina aeronautica (Roma), 18 (4): 898-921. Oct.-Dec. 1955. In Italian, with English summary (p. 918). DLC (TL555.A1R5, v. 18)

Blindfolded subjects fastened to a movable stretcher mounted on a double wheel estimated their position in space (vertical and horizontal) after passive body displacements, slow enough to avoid vestibular stimulation. The margin of error was significantly higher in the first estimations, decreasing with successive ones. Experiments were carried out at ground level and at 3000-4000 meters simulated altitude. Unacclimatized subjects in moderately anoxic conditions displayed: (1) a slightly increased margin of error, indicating moderate impairment of absolute orientation; (2) difficulty in judging the degree of orientation; (3) the need for a longer period of time in which to estimate position; and (4) a degree of uncertainty in the estimation. It is concluded that anoxia affects higher mental activity which in turn causes an instability in absolute orientation.

4832

Purcell, J. B. C.

ACOUSTICAL ANALYSIS OF THE PROPOSED BIO-ACOUSTICS FACILITY, AERO MEDICAL LABORATORY, WRIGHT-PATTERSON AIR FORCE BASE. — Bolt Beranek and Newman, Inc., [Cambridge, Mass.] (Contract AF 33(616)-2151): issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-154, May 1955. vi+69 p. (Project no. 7211). AD 81 239 UNCLASSIFIED

This report summarizes briefly the acoustical analysis and the recommendations for noise control for all the spaces comprising the Bio-Acoustics Research facility for the Aero Medical Laboratory at the Wright-Patterson Air Force Base, Dayton, Ohio. It includes (a) a discussion of the establishment of the acoustical criteria for the various criteria spaces, (b) the establishment of noise reduction requirements for all wall structures, (c) specifications of wall structures, materials, room finishes and dimensions, and (d) general recommendations on the control of noise emanating from ventilating systems. In addition, an interpretation of the program requirements is presented upon which the acoustical analysis was based. Consideration has been given in this analysis not only to the laboratories of this facility but also to the administrative areas. (From the author's introduction)

4833

Purdy, J.,
and E. J. Gibson

DISTANCE JUDGMENT BY THE METHOD OF FRACTIONATION. — Jour. Exper. Psychol., 50 (6): 374-380. Dec. 1955. DLC (BF1.J6, v. 50)

Observers can divide stretches of distance (up to 300 yd.) into halves or thirds with very good accuracy. Perceived magnitudes of distance appear to correspond well with physical magnitudes of distance. There is no tendency for the judgments to follow a hypothetical curve which would result from their being based on the magnitude of the visual angle subtended by different distance stretches. Error is related to the direction of motion of the target. Fractionation of distances was not improved by correcting observer's errors, nor was variability reduced. (From the authors' conclusions)

4834

Quaas, M.

[SOME REMARKS ON THE PROBLEM OF PERIODIC ALTERATIONS OF PHYSIOLOGICAL FUNCTIONS OF THE ORGANISM IN SHIFT WORK] Einige Bemerkungen zu Fragen periodischer Veränderungen physiologischer Funktionen des Organismus bei Schichtarbeit. — Prophylaxe (Jena), 1 (12): 544-550. June 1955. In German. DNLM

After an extensive review of the Russian work on the diurnal periodicity of physiological functions and work efficiency, the author reports on his experiments on the attempts to change the normal diurnal rhythms with drugs and by adaptation to changes in the work schedule. The physiological indices investigated are: erythrocyte count, leukocyte count, blood pressure, blood sugar, pulse rate, and work efficiency.

4835

Quastler, H.,
and V. J. Wulff

HUMAN PERFORMANCE IN INFORMATION TRANSMISSION. PART I: GENERAL REMARKS. PART II: SEQUENTIAL TASKS (OVERLEARNED ACTIVITIES). — Univ. of Illinois. Control Systems Lab., Urbana (Contract DA 36-039-sc-56695). Report no. R-62, March 1955. 70 p. AD 64 468 UNCLASSIFIED

Piano playing was investigated as an example of information transmission through sequential acts.

Information transmission is limited by that one of the following factors which imposes the lowest limits: effective speed (of about 5 1/2 keys/second), effective range (of about 40 keys), effective channel capacity (of about 22 bits/second), or confusion due to oversupply of information. With very low speeds, the effective range can be slightly increased, and vice versa. Attempts to raise the transmission rate by increasing the complexity of the input failed. Typewriting was investigated in a similar manner, with similar results. The rate of information transmission in reading English text is estimated; it is about 24 bits/second. Performance of mental arithmetic is analyzed as an information-transmitting activity. It seems that top performers operate at about 24 bits/second. General results are discussed from the following viewpoints: (a) contribution to methodology, (b) import of estimates obtained, and (c) implication on mechanisms of information processing. (31 references) (From the authors' summary)

4836
Radlow, R.
THE RELATION OF SOME MEASURES OF ABILITY TO MEASURES OF LEARNING FROM SOUND MOTION PICTURES. — Pennsylvania State Univ., University Park (Contract N6ONR-269); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 269-7-58, Sept. 20, 1955. 14 p. (SPECDEVCEN Project 20-E-4). AD 81 666 PB123752

Evidence is presented on the possibility of defining a general film learning ability in terms of well described variables related to film learning. Measures of factual learning from two instructional films (Introduction to measuring instruments and the weather) were obtained for a group of Army basic trainees. The following tests from the Guilford-Zimmerman aptitude survey were selected to give measures of abilities which might be related to learning from films: verbal comprehension, general reasoning, perceptual speed, spatial orientation, and spatial visualization. High verbal comprehension, general reasoning, and spatial orientation were found to be the characteristics of superior film learners. (AD abstract)

4837
Rahn, H.,
and W. O. Fenn
A GRAPHICAL ANALYSIS OF THE RESPIRATORY GAS EXCHANGE: THE O_2-CO_2 DIAGRAM. — vi+ 38 p. Washington: American Physiological Society, 1955. DLC (QP121.R27)

Nomograms are given representing the quantities of oxygen and carbon dioxide found simultaneously in tissues, blood, or lungs during any respiratory maneuver. Conditions of hyperventilation, hypoventilation, exercise, change of posture, CO_2 inhalation, breath holding, normal respiration, O_2 breathing, pressure breathing, altitude breathing, anesthesia, and closed space breathing are considered. (This is a revised edition of the report, item no. 1978, vol. II.)

4838
Rautian, G. N.
[CORRECTION OF ANOMALOUS COLOR VISION WITH LIGHT FILTERS] Ispravlenie anomal'nogo tsvetovogo zreniia svetofil'trami. — Doklady Akademii nauk SSSR (Moskva), 104 (2): 219-222. Sept. 1955. In Russian. DLC (AS262.S3663, v. 104)

With the aid of three types of colored glass (SZS-3, 0.4 mm.; PS-5, 1 mm.; and ZhS-3, 1.5 mm.) a suitable compensating light filter was developed and tested on a number of persons with typical deuteranomaly. The results of the tests are described in great technical detail. No statements are made to indicate that the system proposed or discussed offered any definite practical solutions to the problem of appropriate correction of deuteranomaly.

4839
Ray, W. S.
COMPLEX TASKS FOR USE IN HUMAN PROBLEM-SOLVING RESEARCH. — Psychol. Bull., 52 (2): 134-149. March 1955. DLC (BF1.P75, v. 52)

This is a review of the material used in research on human problem solving. Using complexity of the problem as the principal criterion for selection, 29 problem-solving tasks are briefly described and evaluated. Basic attributes desired in problem-solving tasks are enumerated.

4840
Ray, W. S.
PROBLEM SOLUTION AS A FUNCTION OF A TASK DIFFERENCE [Abstract]. — Amer. Psychologist, 10 (8): 486. Aug. 1955. DLC (BF1.A55, v. 10)

Two groups of 14 airmen in each were presented with a problem. The first group was supplied with negative information only while the second received both positive and negative information. In the first group the subject had to invent and use three hypotheses. In the second group the subject used four hypotheses. It was shown that the two kinds of information, positive and negative, increased the probability of solution as compared with only negative information. Further, an increase in the number of subject-produced hypotheses was accompanied by an increase in the number of solutions.

4841
REFRACTIVE ERRORS AND DEPTH PERCEPTION. — U. S. Navy Med. News Letter, 25 (8): 32-34. April 15, 1955. DNLM

Two cases are reported of defective depth perception due to hyperopic refractive errors in naval aviators. Correction of the refractive error restored good binocular depth perception. Mention is made that defective depth perception occurs in naval aviators over 35 years of age. The spontaneous perception of depth is necessary for the pilot of military aircraft and for the naval pilot especially in carrier landings.

4842
Regier, A. A.
WHY DO AIRPLANES MAKE NOISE? — SAE Transactions, 63: 275-283. 1955. DLC (TL1.S6, v. 63)

The mechanism of aircraft noise generation and the current state of knowledge of the subject are discussed. For propellers the source of noise is

well understood; noise intensities and characteristics can be quantitatively calculated from a knowledge of propeller geometry and aerodynamic performance data. Recent research has extended the application of the theory to near-field noise, forward flight, and counterrotation propellers. The source of jet noise is less well understood, but at present it appears that the jet exit velocity is the most important factor in jet-noise generation. (Quoted in part).

4843
Reid, J. B.,
S. J. Kaplan, and W. H. Melching
A METHOD FOR ANALYSIS OF GROSS BEHAVIOR. — Univ. of Texas. Radiobiological Lab., Austin; and School of Aviation Medicine, Randolph Field, Tex., June 1955. 18 p. (Project no. 21-3501-0003, Report no. 10). AD 78 155 UNCLASSIFIED

A method of data collection has been described that permits presentation of results in a form suitable for purposes of analysis and quantitative comparisons when error scores are lacking or are insufficient for meaningful interpretation of results. The technique is suitable for investigation of human or animal behavior, and readily adaptable for evaluating the behavioral effects of variables, such as drugs. The examples demonstrating its use were selected from an investigation that involved observations of infrahuman primates undergoing exposure to ionizing radiation under conditions that precluded the scoring of successes and errors in accomplishment of any discrete task. (Authors' summary, modified)

4844
Reid, L. S.,
and W. H. Morse
THE INFLUENCE OF COMPLEX TASK VARIABLES ON THE RELATIVE EFFICIENCY OF AUDITORY AND VISUAL MESSAGE PRESENTATION. — Univ. of Virginia, Charlottesville (Contract W33(038)-ac-21269); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-288, April 1955. iv+11 p. (Project no. 7192). AD 88 065 UNCLASSIFIED

Previous research on complex task performance has been aimed at an increased proficiency through the manipulation of certain task and operator variables. Among other findings, the results indicated that degree of practice on a patterned component and task complexity were significantly and independently related to total task proficiency, the former tending to increase proficiency, the latter to reduce it. The present study was an attempt to relate these results to those of the experiments comparing auditory and visual message presentation in which auditory presentation had been consistently demonstrated to be superior under conditions of a simultaneous distracting task. Basically, the experiment involved the comparison of auditory and visual message reception while the subjects were simultaneously engaged in performing a visual discrimination-motor task. Experimental variables were sense channel of presentation, message length, and amount of previous practice on the visual-motor task component whose stimuli occurred in a patterned sequence. Results were measured in terms of overall proficiency of message reception and task performance combined. Practice on the motor task improved this overall proficiency, having a greater differential effect upon the longer messages combined with task than upon the shorter messages plus task. An original superiority of overall performance for the auditory presentation almost disappeared with increasing practice on the motor task. These results completely confirmed the predicted relationships based upon the previous research in both areas noted above. (Authors' abstract)

4845
Replogle, E. H.
AIRCRAFT EJECTION SEAT. — Stanley Aviation Corp., Buffalo, N. Y. U. S. Patent 2,702,677. Feb. 22, 1955. 7 leaves. DP

An ejection seat is described which incorporates mechanical features allowing both relatively decreased weight and vertical and fore- and aft-adjustment of the seat to fit variously sized crewmen.

4846
Replogle, E. H.,
and N. S. Majewski
EJECTABLE AIRPLANE SEAT HAVING LEG RESTRAINING MEANS. — Stanley Aviation Corp., Buffalo, N. Y. U. S. Patent 2,709,557. May 31, 1955. 6 leaves. DP

An airplane seat ejector is described providing leg restraints which (1) are normally folded away, (2) cannot be actuated until the aviator pulls up his lateral leg guards, (3) remain inoperative until the legs are placed in the proper ejection position, (4) prevent the legs from flinging upwards during downward ejection, and (5) allow easy manual or automatic release after ejection.

4847
Replogle, E. H.,
and M. E. Bleck
EJECTION SEAT HAVING LEG BOOSTERS. — Stanley Aviation Corp., Buffalo, N. Y. U. S. Patent 2,765,130. Oct. 2, 1956. 5 leaves. DP

A leg booster designed for use in aircraft ejection seats (1) lifts the legs of the pilot into the correct position for ejection as he performs the pre-ejection functions, (2) provides a guard beside the legs to prevent them from spreading, and (3) automatically releases the legs to permit separation from the seat after ejection.

4848
RESEARCH NOTES FROM THE AVIATION PSYCHOLOGY LABORATORY. — Naval School of Aviation Medicine, Pensacola, Fla. [Unnumbered] Research Report, March 15, 1955. iii+57 p. AD 74 676 UNCLASSIFIED

This is a collection of research reports by various authors, abstracted as items no. 3724, 3765, 4046, 4299, 4426, 4458, 4607, 5124 and 5136.

4849
Rexford-Welch, S. C.
THE ROYAL AIR FORCE MEDICAL SERVICES: HISTORY OF THE SECOND WORLD WAR. VOLUME II, COMMANDS. — xxiv+703 p. London: Her Majesty's Stationery Office. 1955. DNLM (UH215.H673R)

The scope, potentialities and difficulties of the Royal Air Force Medical Services in World War II are presented in chapters dealing with (1) the bomber command (including problems of aviation medicine such as the medical supervision of air-

crews, first aid, oxygen, night vision, frostbite, air sickness, flying stress, flying personnel medical officer); (2) the fighter command (factors influencing efficiency of flying personnel, notification and treatment of aircrew casualties, medical aspects of night flying); (3) the coastal command (medical administration and personnel; flying personnel medical officer); (4) organization of transport, balloon and Army co-operation commands: (5) parachute training; (6) flying training command; (7) technical training command; (8) the second tactical air force; (9) No. 60 group: radar; and (10) special medical problems of the Royal Air Force Regiment.

4850
Richards, E. J.
PROBLEMS OF NOISE IN HELICOPTER DESIGN. — Jour. Helicopter Assoc. Great Britain (London), 9 (1): 225-265. July 1955. DLC (TL716.H44, v. 9)

The problem of helicopter noise is discussed from the standpoint of its effect on the passenger and on the public near landing grounds. Following an enumeration of the sources of helicopter noise (exhaust, rotors, gears, tip-, pulse-, ram- and pressure jets), various silencing devices are described and illustrated. Included are nozzles of the toothed, flutted and crosstail types; gauze and duct silencers, and star cone silencers.

4851
Richardson, R. S. 1954
EXPLORING MARS. — 261 p. New York: McGraw-Hill Book Co., Inc., 1954. DLC (QB641.R55)

The following chapters are presented in a popular treatise, with illustrations, on the exploration of Mars: (1) When Mars swings near; (2) The first men of Mars; (3) Into space-when and how; (4) Astronomical observations from the moon; (5) Celestial target practice; (6) Mars-about time; (7) The atmosphere of Mars; (8) Life on Mars?; (9) The canals; (10) Your own observations of Mars; (11) Mercury; (12) Venus; (13) 44,000 asteroids; (14) Pluto, and (15) The giant planets.

4852
Richter, C. P.
EXPERIMENTAL PRODUCTION OF CYCLES IN BEHAVIOR AND PHYSIOLOGY IN ANIMALS. — Acta medica scandinavica (Stockholm), Suppl. 307: 36-37. 1955. In English. DNLM

Biological cycles of activity, food intake, and estrus of highly regular frequencies which deviate from the normal have been produced experimentally in animals by interference with the endocrine glands. A summary of the research results is presented.

4853
Riedesel, M. L.
SERUM MAGNESIUM LEVELS IN HETEROTHERMIC ANIMALS EXPOSED TO COLD. — Publication no. 14,142. Ann Arbor: Univ. Microfilms, 1955. x+124 p. 72 refs. DLC

An elevation of serum magnesium concentration was observed in bats, ground squirrels, and hamsters during early and prolonged hibernation. Specific gravity and hematocrit determinations indicated that the increase was not due to concentration of the blood through loss of water. In the hamster a decrease in serum potassium was observed during cold exposure and hibernation. Serum calcium decreased in the bat during prolonged hibernation. Arousal to a body temperature of 18° C. was accomplished in bats without a decrease in magnesium level; one hour after arousal, however, the magnesium level was decreased. Cold exposure for 18-32 hours without hibernation had no effect on magnesium or other serum electrolyte levels in bats.

4854
Riggs, L. A.
ELECTRICAL ACTIVITY OF THE HUMAN EYE. — In: Office of Naval Research, Symposium on physiological psychology, p. 83-91. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100 UNCLASSIFIED

Some of the recent studies on the electroretinogram are described, particularly, those relating the ERG to psychophysical data on vision.

4855
Ritchie, M. L., and A. L. Michael
TRANSFER BETWEEN INSTRUMENT AND CONTACT FLIGHT TRAINING. — Jour. Applied Psychol., 39 (3): 145-149. June 1955. DLC (BF1.J55, v. 39)

Twenty-two subjects were taught two flight maneuvers on contact and on instruments. One group learned contact first, the other instruments first. Contact training took significantly fewer trials to learn. Transfer from contact to instrument was -22%. Transfer from instruments to contact was 47%. The variance due to transfer effects was significant at the .05 level. The results confirm indications from previous studies that these instruments involve learning habits which are incompatible with population stereotypes. Implications for training and for instrument design are discussed. (Authors' summary)

4856
Rivolier, J.
[THE RELATION OF COLD AND ALTITUDE TO NUTRITION] Froid et altitude dans leurs rapports avec l'alimentation. — Annales de la nutrition et de l'alimentation (Paris), 9 (3): 135-177. 1955. In French. DNLM

A general discussion is presented of questions of nutrition during extended exposures to cold and altitude. Subjects considered include the effects of cold on the basal metabolism, nutritional utilization, hydration, and time of gastric evacuation, problems of thermal loss, fatigue and digestive disturbances, and the physiological effects of altitude. The requirements of man in cold or at altitude for specific nutritional components are discussed, including minerals, vitamins, carbohydrates, fats, proteins, and caloric content. The nutritional requirements of airmen are briefly considered.

4857
Rivolier, J.
[ON ACCLIMATIZATION TO ALTITUDE] A propos de l'acclimatization à l'altitude. — Concours médical (Paris), 77 (18): 1811-1818. April 30, 1955. In French. DNLM

A general discussion is presented on the process of altitude acclimatization and the various protective measures used with ascent to high altitudes. Also noted are the manifestations of mountain sickness (including headache, asthenia, digestive, nervous and mental disorders, lassitude, fatigue) as they occurred in mountain climbers of the French Expedition to Makalu (8,470 meters) in 1954.

4858
Rivolier, J.
[USE OF OXYGEN IN HIGH MOUNTAINS] Utilization de l'oxygène en haute montagne. — Concours médical (Paris), 77 (19): 1925-1934. May 1955. In French. DNLM

The types of open-circuit and closed-circuit oxygen inhalators used in aviation and in mountain climbing are described and illustrated. Special mention is made of their use during the 1952 and 1953 expeditions to Mount Everest (6,000-8,500 meters of altitude).

4859
Rizzo, P.
[EFFECT OF ALCOHOL ON THE RAYLEIGH EQUATION USING THE NAGEL ANOMALOSCOPE] Effetto dell'alcool sull'equazione di Rayleigh all'anomaloscopio di Nagel. — Rivista di medicina aeronautica (Roma), 18 (2): 338-357. April-June 1955. In Italian, with English summary (p. 351-352). DLC (TL555.A1R5, v. 18)

The effect of ethyl alcohol ingestion (1 g./kg. of body weight) on the Rayleigh equation (test of anomalous color vision) was studied in twenty normal subjects correctly reading Ishihara pseudo-isochromatic plates by means of the Nagel anomaloscope. Measurements were made every 5-10 minutes for a one hour period. It was observed that changes, though significant, occurred within normal limits and that alcohol ingestion did not induce an anomaly. It is noted that these results are similar to those obtained from persons subjected to anoxia and to ocular compression. In addition, the possible peripheral or central action of alcohol is discussed with relation to Granit's theory of dominators and modulators. (45 references)

4860
Roach, J. H. L.,
and E. M. Wall
PRELIMINARY EXPLORATION OF PERSONALITY FACTORS RELATED TO SUCCESS IN A HIGH-LEVEL MILITARY SCHOOL. — Jour. Educational Psychol., 46 (4): 247-250. April 1955. DLC (LB1051.A2J6, v. 46)

Personality factors were investigated in fourteen officers in the Air Command and Staff School, who differed greatly in their achievement in the course in spite of falling in the C group on the Initial General Survey Test and having similar scores on the American Council on Education Psychological Examination. Six officers ended in the top 7% of the class and eight in the bottom 7%. The faculty evaluation of this group in respect to twenty personality variables rated the over-achievers higher on ten factors. The over-achievers were also rated significantly higher by their fellow students on leadership, growth potential, reliability and responsibility, over-all evaluation, judgment, and cooperation. It is felt, that personality differences, particularly leadership, judgment, reliability, and personal responsibility, account at least in part for the superior achievement of these six officers.

4861
Robards, R. E.
THE CARBON MONOXIDE PROBLEM. — Continental Air Command Medical Training Bulletin, 3 (1): 16-19. March 1955. DNLM

The role of carbon monoxide in aviation as an accompaniment of contamination from by-products of combustion is stressed. The tolerable limits of carbon monoxide in the blood as a function of time of exposure and air carbon monoxide concentration are briefly discussed.

4862
Robert, P.
[HEARING AND THE AVIATOR. II. THE AUDITORY PASSAGES IN THE AVIATOR] L'audition et l'aviateur. II. Les voies de la transmission chez l'aviateur. — Médecine aéronautique (Paris), 10 (3): 229-245. 1955. In French. DLC (TL555.M394, v. 10)

Inflammation and swelling of the pharyngeal area, nasal cavity, and Eustachian tubes are important elements in the occurrence of barotrauma. In susceptible individuals after as little as 1000 hours of flight, hypertrophy of the nasal bones, maceration of the passages, and congestion of the pharynx, throat, and Eustachian tubes often appear. In the initial stage of the affection, hearing becomes slightly impaired, and intermittent tubular catarrh occurs. This stage is followed by one characterized by chronic catarrh which eventually totally blocks the Eustachian tubes. Total loss of hearing at low sound intensities then results.

4863
Robert, P.
[THE PROBLEM OF EQUILIBRATION IN THE AVIATOR] Le problème de l'équilibration chez l'aviateur. — Médecine aéronautique (Paris) 10 (2): 155-166. 1955. In French. DLC (TL555.M394, v. 10)

A discussion is presented of the problem of equilibration in aviation, including a definition of terms, explanation of the phenomenon of the equilibrium sense and its variations encountered in aviation, and reference to the selection and training of pilots.

4864
Robert, P.,
and Burgeat
[SOME CONSIDERATIONS OF THE SUSCEPTIBILITY OF THE EAR TO NOISE] Quelques considérations sur la susceptibilité auriculaire au bruit. — Médecine aéronautique (Paris), 10 (4): 363-365. 1955. In French. DLC (TL555.M394, v. 10)

The auditory pain threshold in 128 pilot candidates not previously exposed to auditory trauma was determined to investigate the possibility of correlation between a low threshold and susceptibility to noise-induced deafness. The ears of the subjects were exposed directly to complex noise bands of 32-10,600 c.p.s., 4300-6900 c.p.s., and 6800-10,600 c.p.s. at a uniform intensity of 94 db. In 14 subjects (9%), the pain threshold was encountered at around 90 db., in 2 at a frequency of 32-10,600 c.p.s., in 6 at 6800-10,600 c.p.s., and in 5 at 4300-6900 c.p.s. The pulse rate was measured in 54 subjects before and after exposure. The

rate was raised an average of 1.2 pulses/min. in insensitive subjects, and 22.4 pulses/min. in the five subjects experiencing pain. In a second series of experiments, in which noise was broadcast from a short distance, one of 13 subjects experienced pain. It is intended to examine the subjects after a certain number of hours of flight to determine any correlation between these results and hearing loss.

4865
ROCKING, NOT TUMBLING, IS BAILOUT HAZARD. — Aviation Week, 63 (26): 21. Dec. 26, 1955. DLC (TL501.A8, v. 63)

Ejection experiments were conducted with an anthropomorphic dummy to simulate the effects of supersonic bailout. The findings demonstrated that rocking and yawing motions rather than complete revolutions in tumbling were the chief cause of pilot injuries sustained during a high-speed bailout.

4866
Rockway, M. R.
THE EFFECT OF VARIATIONS IN CONTROL-DISPLAY DURING TRAINING ON TRANSFER TO A "HIGH" RATIO. — Ohio State Univ., Columbus (Contract AF 18(600)-78); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-366, Oct. 1955. iv+13 p. (Project no. 7197, Task no. 71635). AD 98 317 PB 121316

Three groups of subjects received training on a two-dimensional compensatory tracking task using one of three different control-display ratios. The three ratios were such that 1° of control deflection produced either 3-, 9-, or 27-sixteenths inches of display movement. Following training, all groups were tested on the task using the 1:3 ratio. The experimental results were as follows: (1) during training the groups using the 1:3 and 1:9 ratios performed at a significantly higher level than the group using the 1:27 ratio; (2) all groups displayed a significant amount of positive transfer to the test task; and (3) the amount of transfer to the initial test trial was a function of the training ratio employed. Differential transfer effects were very transitory and by the second test trial differences among groups were no longer significant. (From the author's abstract and summary)

4867
Rodahl, K.
ARCTIC SURVIVAL PROBLEMS. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 41-51. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

A brief discussion of the basic problems of Arctic survival includes consideration of the environment and topography of the Arctic (North Polar Basin), means of protection against the environment, survival rations, water supply, and indoctrination of airmen in survival technique.

4868
Rodahl, K.
NUTRITIONAL REQUIREMENTS OF TROOPS STATIONED IN ALASKA. — Arctic Aeromedical Lab., Ladd Air Force Base, Alaska. June 1955. iv+105 p. (Project no. 7-7954, Report no. 1). AD 123 811 UNCLASSIFIED

A series of nutritional surveys, together with detailed clinical, physiological, and biochemical examinations, was carried out among a group of airmen and a group of infantry soldiers during the four seasons of the year at Ladd Air Force Base in Alaska from 1950 to 1952. Simultaneously, similar studies were made among four groups of Eskimos for comparison. Average gross consumptions which maintained body weight was found to be 3000 calories per man per day for the Air Force group, 3200 calories for the Infantry group, and 3100 calories for the Eskimo group. The percentages of calories furnished by protein, fat, and carbohydrate in the diet of American Army troops living in Alaska are not significantly different from those reported for US troops eating a garrison ration in the temperate or tropic climates. In the Air Force group, however, there was an increased consumption of fat in the winter. The consumption of minerals was higher than the recommended allowance for the temperate climates. The general problem of human vitamin C requirements in the Arctic is discussed in the light of the fluctuation of its consumption by the three experimental groups and other recent evidence. (Author's summary and conclusions, modified)

4869
Roddie, R. A.
THE EFFECT OF ARM POSITION ON THE HEAT ELIMINATION FROM THE FINGERS [Abstract]. — Jour. Physiol. (London), 127 (1): 11P-12P. Jan. 28, 1955. DLC (QP1.J75, v. 127)

The rate of heat elimination from the tips of three fingers of seated subjects was found to increase as the arm was moved from a horizontal to a dependent position. A correlation of increased heat elimination with increased blood flow and decreased peripheral resistance is suggested.

4870
Roelofs, O.,
and W. P. C. Zeeman
APPARENT SIZE. — Ophthalmologica (Basel), 129 (3): 166-186. March 1955. In English. DNLM

The size of a luminous rectangle observed in a mirror at various distances was altered and made equal to the apparent size of a standard at a distance of 1 m. With monocular vision in the dark, size-constancy proved to be lost; the visual space shrunk into practically one single plane in which apparent distances and apparent sizes of objects may be influenced by auto- and hetero-suggestion. With binocular vision in the dark, with the aid of convergence impulses, size-constancy existed only within a distance of 4.5 m. At distances of 4.5 to 26.6 m. the apparent size of an object decreased, but less than the size of the retinal image belonging to it. At a distance of more than about 27 m. the apparent size decreased proportionately to the reduction in size of the retinal image. A final conclusion is that convergence impulses can directly influence both apparent size and apparent distance. (Authors' summary)

4871
Rohracher, H.
[THERMOREGULATION AND MICROVIBRATION] Wärmehaushalt und Mikrovibration. — Acta neurovegetativa (Wien), 11 (1-4): 187-200. 1955. In German, with English summary (p. 199). DNLM

Continuous microvibration was demonstrated in the human and infra-human warm-blooded organisms. It was absent in the cold-blooded animals examined. In healthy men the frequency ranges from 6 to 12 c.p.s., with the amplitude ranging from 1 to 5 microns at complete muscular relaxation. Sleep, paralysis, and hibernation reduce or interrupt the vibrations. Muscular tension, hyperthyroidism, and fever increase the microvibrations. A relationship is postulated between the microvibrations and the constancy of body temperature in the warm-blooded animals. All striate muscles of the warm-blooded animals vibrate continuously even while at rest. The microvibrations are controlled by impulses stemming from the autonomic nervous system. The metabolic processes caused by the continuous muscle action together with other metabolic processes constitute the basis for heat production and thermal constancy of the warm-blooded animal.

4872
Romander, Å.
[THE REQUIREMENT FOR RELIANCE ON INSTRUMENTS IN BLIND LANDING] Krav på instrumentutrustning för blindlandning. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 14 (1): 24-27. 1955. In Swedish, with English summary (p. 27). DNLM

In view of the limited human capacity of performing several actions simultaneously, it is considered almost impossible to perform instrument-landing under zero-zero weather conditions if the instrument indicates only the position of the aircraft. The instrument must instead advise the pilot on the handling of the controls. Examples of the latter type are the Sperry Zero Reader or Horizon Flight Director and the Collins Approach Horizon.

4873
Rosenberg, N.,
C. E. Izard, and E. P. Hollander
MIDDLE CATEGORY RESPONSE: RELIABILITY AND RELATIONSHIP TO PERSONALITY AND INTELLIGENCE VARIABLES. — Educational and Psychol. Measurement, 15 (3): 281-290. Autumn 1955. DLC (BF1.E3, v. 15)

Essentially the same as item no. 2025, vol. II.

4874
Rosenblith, W. A.
EFFECTS OF NOISE ON MAN: PROBLEMS FOR STUDY. — Noise Control, 1 (4): 22-27. July 1955. DLC (TA365.N6, v. 1)

The effects of prolonged noise exposure on man are manifested by: (1) hearing loss; (2) interference with speech communication; (3) the production of extra auditory effects at levels near and above pain, and (4) a decrease in mental performance. A study program is outlined for dealing with the problems of industrial hearing loss; human tolerance to high noise frequencies, and hearing conservation.

4875
Rosendahl, C. E.
AIRCRAFT NOISE PROBLEM IN AIRPORT VICINITIES. — SAE Transactions, 63: 289-294. 1955. DLC (TL1.S6, v. 63)

The National Air Transport Coordinating Committee was created to study and attempt to solve the community problems arising from the civil air transport service in the New York-New Jersey metropolitan area. In the area of noise control the committee has attempted to reduce noisy flights over residential areas to an achievable minimum, to control noise from ground run-ups, and to provide interested residents with factual information on the subject. Emphasis has been placed on increasing the distance between the noise source and neighboring residents by maximum use of preferential runways farthest from residential areas, by transfer of training flights away from the area, and by increasing approach, circling, and take-off altitudes.

4876
Ross, S.,
L. T. Katchmar, and H. Bell
MULTIPLE-DIAL CHECK READING: POINTER SYMMETRY COMPARED WITH UNIFORM ALIGNMENT. — Jour. Applied Psychol., 39 (4): 215-218. Aug. 1955. DLC (BF1.J55, v. 39)

Two experiments were performed concerned with testing the difference between uniform and symmetrical alignment of pointers of instrument dials, in addition to assessing the effects of practice. The following conclusions are made: (1) Configurations employing uniform alignment or symmetrical alignment of pointers are equally effective for check reading after an extended period of practice. (2) During the early stages of practice, configurations employing symmetrical alignment appear to be more difficult than configurations employing uniform alignment. (3) Transfer effects from pointer symmetry to uniform alignment are greater than the transfer effects from uniform alignment to pointer symmetry. A convenient technique for group testing of check reading of projected dial faces, which are easily modified, has been described. (Authors' summary, modified)

4877
Ross, S.,
B. E. Shepp, and T. G. Andrews
RESPONSE PREFERENCES IN DISPLAY-CONTROL RELATIONSHIPS. — Jour. Applied Psychol., 39 (6): 425-428. Dec. 1955. DLC (BF1.J55, v. 39)

The experiment was directed at the determination of response preferences under varied conditions. Using a group-administered paper-and-pencil test, three responses from each of 679 subjects were obtained for three different control devices (rotary knob, push-pull, and lever) which were arranged on three different planes. The display was held constant and responses were obtained for desired signal movements of right, left, up, and down. The results indicate that response preferences do exist. These preferences are found under certain conditions, and vary with the control, the plane, and the desired signal movement. (Authors' summary)

4878
Roth, E. M.
MEDICAL ASPECTS OF TRAVEL IN OUTER SPACE. — Harvard Med. Alumni Bull., 29 (4): 10-13. July 10, 1955. DNLM

A brief discussion is presented of the physiological stresses encountered during the launching

of a space vehicle and during space flight. Included stresses are linear acceleration, heat, weightlessness, low oxygen content, dysbarism, and ultraviolet and cosmic rays.

4879
Rotondo, G.
[ON THE USE OF DEHYDROISOANDROSTERONE IN PILOTS WITH FLIGHT FATIGUE] Sull'impiego del deidroisoandrosterone in piloti affetti da fatica da volo. — Rivista di medicina aeronautica (Roma), 18 (1): 78-88. Jan.-March 1955. In Italian, with English summary (p. 86-87).
DLC (TL555.A1R5, v. 18)

Seven jet pilots with hypocorticalism associated with operational fatigue displayed a marked improvement following prolonged treatment with dehydroisoandrosterone (Neurostress). Some pilots exhibited a slight increase in body weight and arterial pressure. All of the treated pilots demonstrated a remarkable increase in the urinary excretion of 17-keto-steroids (from 9.07± 1.04 to 14.37± 1.98 mmg. in 24 hours).

4880
Rotta, A.
[THE CARDIO-THORACIC INDEX IN THE INHABITANT OF HIGH ALTITUDES] El indice cardiotoracico en el habitante de las grandes alturas. — Anales de la facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Peru), 38 (1): 17-21. 1955. In Spanish. DNLM

The cardio-thoracic index showed an increase in persons living at high altitude (Morococha, Peru, 4540 meters of altitude) who also exhibited an increase in the transverse diameter of the heart and thorax, in comparison to those living at sea level (Lima, Peru), 143 meters of altitude). These findings indicate that physiological hemodynamic requirements induce the mechanism of adaptation to the low barometric pressure of high altitudes.

4881
Rotta, A.
[WEIGHT OF THE HEART IN NORMAL MAN AT ALTITUDE] Peso del corazón en el hombre normal de la altura. — Revista peruana de cardiología (Lima), 4 (2): 71-77. July-Dec. 1955. In Spanish, with English summary (p. 77). DNLM

Five hearts from natives of Morococha, Peru, (14,900 feet), who died suddenly in work accidents were dissected and the ventricular weights recorded. The left ventricle/right ventricle ratio showed gross right ventricular hypertrophy in two cases, moderate hypertrophy in another two, and a normal appearance in the remaining case. Calculation of Müller's function index roughly followed the results of the left ventricle/right ventricle ratio. Pulmonary hypertension found in persons at high altitude is suggested as an etiological factor of right ventricular hypertrophy. (Author's summary, modified)

4882
Roxburgh, H. L.
PHYSIOLOGICAL REQUIREMENTS OF PRESSURE CABINS. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 62-67. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no.6)

The conditions of cabin pressurization, temperature, and air circulation required for maximal crew efficiency and comfort are discussed. The relative merits are considered of cabin pressurizations of 25,000 and 8,000 feet in reducing potential damage from explosive decompression, decompression, and anoxia. Since thermal comfort is concluded to be dependent on clothing and variable environmental conditions such as radiation from the sun, it is recommended that cabin temperature be automatically controlled at a level selected by the crew.

4883
Royce, M.
STUDIES FOR STUDENT PILOTS. — London: Sir Isaac Pitman Sons, Ltd., 1955. ix+282 p.
DLC (TL546.R6)

Basic theories of meteorology, flight and airframes, navigation, instruments, and piston-type aero engines are discussed for the student pilot in a form which is simple but adequate to meet the requirements for the commercial pilot's license in all flight subjects except radio aids. Operation and advanced flight planning are discussed in a series of appendices.

4884
Rubinstein, M. K., and M. Loeb
INTERACTION BETWEEN VISION AND AUDITION. — Army Medical Research Lab., Fort Knox, Ky. Report no. 151, Jan. 21, 1955. 1+14 p. AD 55 061
UNCLASSIFIED

Visual acuity measurements were determined for 18 subjects during exposure to white noise for pure tones at 75 and 100 decibels. An analysis of the data obtained suggests that when a grating is used as the stimulus object for visual acuity measurements, auditory stimulation tends to impair visual acuity. These results cannot be generalized to experiments employing different sequences of auditory stimulation. The changes were statistically significant but of little practical importance, and, in addition, there are large individual differences. Auditory thresholds at 8 different frequencies were obtained for the 20 subjects at 7 levels of illumination. Results indicate that the visual stimulation employed did not significantly influence auditory thresholds. (Authors' summary and conclusions)

4885
Ruff, S.
[AEROMEDICAL REQUIREMENTS FOR THE MODERN EVOLUTION OF AVIATION TECHNOLOGY] Flugmedizinische Forderungen für die moderne Flugzeugentwicklung. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 228-231. 1955. In German, with English summary (p. 231). DLC (TL503.W5563, v. 1954)

The post-war development of aviation medicine in Germany is summarized. Application of aeromedical knowledge to treatment and diagnosis of patients with congenital heart defects has proven to be fruitful for clinical medicine and in turn has benefited aviation-medicinal research in adaptation mechanisms to high altitude. The develop-

ment of aviation can be divided into three stages. During the first stage emphasis was placed on technological problems. The second stage, which also includes the present, saw physiological problems emerge next to technological problems. In the third stage further advances in the development of modern aircraft will assign greater importance to psychophysiological problems.

4886
Ruff, S.
[ON THE EFFECT OF INTERRUPTION OF FLIGHT ACTIVITY ON THE DAMAGED HEARING ORGAN] Über den Einfluss langjähriger Unterbrechung der fliegerischen Tätigkeit auf das geschädigte Hörorgan. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 195[illegible] p. 225-228. 1955. In German, with English summary (p. 228). DLC (TL503.W5563, v. 1954)

Results of examinations of hearing damage in pilots are reported. Examination by audiometry of hearing in pilots of the German Luft-Hansa after nine years interruption of flying showed persistence of hearing damage evident in 1943, which however at the time could not be classified as irreversible. Importance of speech audiometry in preference to pure tone audiometry for aviation is discussed.

4887
Ruff, S.
[IS IT TRUE, THAT FLIGHT ACCIDENTS ARE FOR THE MOST PART CAUSED NOT BY TECHNICAL DEFECTS, BUT BY A FAILURE OF THE PILOT?] Stimmt es, dass Flugzeugunfälle meistens nicht durch technische Mängel, sondern durch ein Versagen des Piloten zustandekommen? — Deutsche medizinische Wochenschrift (Stuttgart), 80 (26): 1012. July 1, 1955. In German. DNLM

The requirements for a commercial civil aeronautics pilot's license are briefly explained. In order to avoid excessive pilot fatigue prophylactic measures have been taken to limit the number of flying hours within a month or a quarter. Periodic physical and psychological examinations are required for renewal of the license.

4888
Ruff, S.
[WHICH PATIENTS SHOULD BE COUNSELLED AGAINST FLIGHT TRAVEL?] Welchen Kranken muss von einer Luftreise abgeraten werden? — Deutsche medizinische Wochenschrift (Stuttgart), 80 (25): 976. June 24, 1955. In German. DNLM

Flight travel is contraindicated for patients with active tuberculosis or after a pneumothorax, and for patients with angina pectoris.

4889
Ruiz-Gijon, J.
[REGULATION OF BLOOD PRESSURE IN ANOXIA AND DURING OXYGEN BREATHING] Die Regulierung des Blutdruckes während der Hypoxie und der Sauerstoffatmung. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 191-193. 1955. In German, with English summary (p. 193). DLC (TL503.W5563, v. 1954)

The effects of anoxia (decompression chamber or gas mixtures) and of oxygen breathing were studied on anesthetized intact and on unanesthetized decerebrated cats. Anoxia under chloralose anesthesia had only a slight effect, usually a slight rise, on the blood pressure; under methane anesthesia it resulted in a fall of blood pressure. Oxygen breathing under chloralose anesthesia gave inconsistent results, under methane anesthesia or after decerebration it usually effected a rise in blood pressure. The author ascribes these differences to the action of the narcotics on the carotid sinus reflexes which disturbs the equilibrium between the central and peripheral regulation of the blood pressure.

4890
Rutenfranz, J.
[ON A DAILY RHYTHM OF THE ELECTRICAL RESISTANCE OF THE SKIN IN MAN] Zur Frage einer Tagesrhythmik des elektrischen Hautwiderstandes beim Menschen. — Internationale Zeitschrift für angewandte Physiologie (Berlin), 16 (2): 152-172. 1955. In German. DNLM

Hourly measurements of the resistance of the skin to alternating and direct electrical currents were conducted in two subjects for 12 or 17 nearly consecutive days. Extreme variations in resistance from day to day were observed. The daily rhythm was determined as a percentage of the mean resistance for each day. Four periods distinguished in the daily rhythm were: (1) 8-12 A.M. (after breakfast), (2) 1-3 P.M. (after midday meal), (3) 4-9 P.M. (before evening meal), and (4) 11 P.M. - 5 A.M. (sleep). Skin resistance was seen to increase above the mean (160-190%) during the first and third periods, and fell to the mean during the second period. During sleep, resistance steadily fell to a low of 0-40% from 12 P.M. to 3 A.M. The observed changes in resistance are considered to reflect ergotropic and trophotropic changes in the vegatative nervous system, and are associated with variations in the physiological "energy potential".

4891
Sabiston, D. C.,
E. O. Theilen, and D. E. Gregg
THE RELATIONSHIP OF CORONARY BLOOD FLOW AND CARDIAC OUTPUT AND OTHER PARAMETERS IN HYPOTHERMIA. — Surgery, 38 (3): 498-505. Sept. 1955. DNLM

Dogs rendered hypothermic (25-26° C.) by direct blood cooling showed significant decreases in oxygen consumption, heart rate, mean arterial pressure, cardiac output, and coronary blood flow. Circulation time was increased 208%. A greater reduction in cardiac output than in coronary flow resulted in an increase in the coronary fraction of cardiac output.

4892
Sachsenweger, R.
[EXPERIMENTAL INVESTIGATION ON THE EFFECT OF FATIGUE ON SPACE PERCEPTION] Experimentelle Untersuchungen über den Einfluss der Ermüdung auf das räumliche Sehen. — Deutsche Zeitschrift für die gesamte gerichtliche Medizin (Berlin), 44 (1): 66-76. 1955. In German. DNLM

The effects of fatigue on binocular depth perception were investigated experimentally. Artificial fatigue was induced by 1.0-gram doses of adalin (bromo-diethyl-acetyl carbamide) orally. The

depth perception was measured by a modified rod apparatus. On the average, fatigued subjects required greater spatial distances in brief exposures of the test object to perceive a spatial separation; this was particularly apparent with extremely short exposure times. There are pronounced individual differences in susceptibility to fatigue. The causal factors for decreased depth perception in fatigue are discussed at great length with emphasis on the satiation effect. In individuals with latent heterophoria, fatigue under lowered illumination weakens the power for fusion with resulting disintegration of binocular vision. The effects of fatigue on depth perception are best compensated for by stimulants.

4893
SAFETY ASPECTS OF FLIGHT TEST OPERATIONS. — Skyways, 14 (6): 14-17, 38-40. June 1955. DLC (TL501.S634, v. 14)

A round-table discussion of the problems of flying safety by a group of test pilots includes consideration of questions of personnel equipment (pressure suits, oxygen masks, ejection devices, pilot comfort), instrumentation for navigation and flying, air collision, jet landings, brake failures, and test pilot intercommunication.

4894
Sahlein, H. F.
SIMULTANEOUS TWO-HAND TRACKING PERFORMANCE USING CURVILINEAR-LINEAR AND CURVILINEAR-CURVILINEAR CONTROL-POINTER MOTION RELATIONS IN COMBINATION [Abstract]. — Amer. Psychologist, 10 (8): 489. Aug. 1955. DLC (BF1.A55, v. 10)

Four subjects performed with both hands simultaneously a continuous two-dimensional target acquisition task. The left-hand performance was (a) poorest and influenced more by target speed when both control movements were in the same direction, and (b) best when the left- and right-control movements were clockwise and counterclockwise, respectively. The right-hand performance was poorest when the left-hand performance was best. The results suggest bilateral interference and a confusion of the control-display relationship especially for the 6 o'clock sector.

4895
Santi, G. P.
ACCELERATION PROBLEMS IN EJECTION-SEAT DESIGN. — Office of the Secretary of Defense, Research and Development, Washington, D. C., Supplement to Shock and Vibration Bulletin, no. 22, p. 40-46; discussion p. 46-47. July 1955. DNLM

Tests conducted to measure forces operating in the D-ring firing system of downward-ejection seats and in the ejection of seats through plexiglas canopies are described. A loaded spring shock absorber was developed to reduce forces on the D-ring after dummy ejection tests during flight at speeds of 225 to 425 knots revealed the operation of intolerable forces at higher speeds. Successful live ejections were conducted with the new device to a maximum air speed of 423 knots. Force measurements made during the ejection of a dummy through a laminated plexiglas canopy indicate a maximum vertical impact force of 9000 pounds and an apparent breakthrough force of 2600 pounds.

4896
Sargent, F.,
V. W. Sargent, R. E. Johnson, and S. G. Stolpe
THE PHYSIOLOGICAL BASIS FOR VARIOUS CONSTITUENTS IN SURVIVAL RATIONS. PART II. THE EFFICIENCY OF YOUNG MEN UNDER CONDITIONS OF MODERATE COLD. — Univ. of Ill., Urbana (Contract AF 18(600)-80); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 53-484, Part II, vol. 1, May 1955. xxii+378 p. (Project no. 7156). AD 78 282 PB 137374

From February 22, 1954, through April 4, 1954, 87 volunteer airmen and 12 volunteer non-commissioned officers served as subjects in a study of survival rations in moderate cold at Chanute AFB and in the field at Camp McCoy, Wisconsin. The base laboratory was at McKinley Hospital, University of Illinois, Urbana. To establish physiological, biochemical, nutritional, and clinical judgments on the relative effects of work, water, calories, and protein/carbohydrates/fat ratio in all-purpose survival rations, numerous observations were made in two-week periods of adequate, restricted, and recovery diets, with luxus amounts of vitamins at all times. Starvation and a 3000-Calorie adequate ration represented the worst and best regimens. Twenty nutrient combinations could be rank-ordered, by 21 different tests, with respect to effects on organ function and body efficiency. Clinical findings could also be rated. Below the 3000-Calorie control ration, the highest score was attained both in hard work and in light work by a combination supplying unlimited water, 2000 Calories per day, and a distribution of calories of 15% protein, 52% carbohydrate, and 33% fat. Limitation of water, decrease of calories, or marked deviations in protein/carbohydrate/fat ratios resulted in measurable clinical or functional deterioration. (Authors' abstract)

4897
Sargent, F.,
V. M. Sargent, R. E. Johnson, and S. G. Stolpe
THE PHYSIOLOGICAL BASIS FOR VARIOUS CONSTITUENTS IN SURVIVAL RATIONS. II. THE EFFICIENCY OF YOUNG MEN UNDER CONDITIONS OF MODERATE COLD. — Univ. of Ill., Urbana, (Contract AF 18(600)-80); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 53-484, Part 2, vol. 2, May 1955. iv+328 p. (Project no. 7156). AD 78 283 UNCLASSIFIED

The original data collected during the 6-wk period of study on the 99 volunteer subjects (cf. item no. 4896) are detailed. (AD abstract)

4898
Sarnoff, S. J.,
and R. B. Case
PHARMACOLOGIC SUPPORT OF THE CIRCULATION DURING POSITIVE PRESSURE BREATHING [Abstract]. — Federation Proceedings, 14 (1[1]): 130. March 1955. DLC (QH301.F37, v. 14)

Almost complete circulatory standstill was produced by breathing at positive pressures of 50-60 mm. Hg for 4-6 minutes in anesthetized dogs with elastic bands applied to thorax, abdomen, and extremities. Electrocardiographic examination showed evidence of myocardial hypoxia. Circulation was re-

stored by removal of pressure or by intravenous injections of Aramine. Aramine reversed the decrease in heart size and lung density observed by fluoroscope during positive-pressure breathing. It is suggested that Aramine, by affecting peripheral vascular tone, resists the displacement of blood from the lungs to the periphery, thereby sustaining ventricular filling.

4899
Sataloff, J.
OCCUPATIONAL HEARING LOSS. — Eye Ear Nose and Throat Monthly, 34 (2): 105-107. Feb. 1955. DNLM

The etiology and pathogenesis of occupational deafness is briefly discussed with reference to occupations exposed to intense noise, including those within the aircraft industry. It is suggested that industrial programs of hearing conservation include: (1) routine pre-employment or pre-placement audiometry; (2) routine hearing determinations at specified time intervals for all employees exposed to intense noise; (3) an evaluation of the role of temporary hearing loss among employees; and (4) a correlation of noise surveys to determine noise areas with the establishment of safety precautions and protective measures.

4900
Sauerwein, E.
[INVESTIGATION OF THE BEHAVIOR OF BLOOD GLYCOGEN IN VEGETATIVE REACTIONS EVOKED BY VESTIBULAR STIMULATION] Untersuchungen über das Verhalten des Blutglykogens bei vegetativen Reaktionen—ausgelöst durch Vestibularisreizung. — Acta neurovegetativa (Wein), 10 (4): 459-469. 1955. In German. DNLM

Investigations were conducted with trained and untrained subjects to observe the changes in blood sugar, blood lactate, total blood glycogen, and plasma glycogen after controlled rotatory vestibular stimulation. Adrenergic and cholinergic responses to vestibular stress were observed in different subjects for the sugar and lactate levels of the blood and the plasma glycogen. Total blood glycogen exhibited an adrenergic response to vestibular stress, since it increased in most subjects after the stress. There was no relationship between the resting values and the direction of the response except for blood sugar. The physical condition of the subject may influence the direction of the plasma glycogen response. The plasma glycogen decreased in trained subjects. It is hypothesized that vestibular stress evokes a purely ergotropic response overlaid with trophotropic responses, which result from a spill-over of the total ergotropic excitation. The coordination of the autonomic nervous system in physical training is viewed as a quantitative problem.

4901
Saul, E. V.,
and J. Jaffe
THE EFFECTS OF CLOTHING ON GROSS MOTOR PERFORMANCE. — Tufts Coll., Medford, Mass. (Contract DA44-109-qm-1124); issued by Quartermaster Research and Development Center. Environmental Protection Division, Natick, Mass. Technical Report no. EP-12, June 1955. iv+33 p.
AD 66 180 PB 118138

An investigation was carried out to determine the usefulness of 28 performance tests and devices which might reliably reflect the restriction effects of Quartermaster clothing and personal equipment. In general, these were tests of flexibility, steadiness and coordination of gross motor movement. The data obtained were analyzed with respect to reliability, sensitivity and interrelations of the tests with each other. A majority of the tests indicated that performance is impaired as amount of clothing is increased. Certain of these tests showed considerable promise as useful methods for evaluating clothing restriction. (Authors' abstract)

4902
Saulnier, R.
EMERGENCY PILOT EJECTOR. — U. S. Patent 2,671,622. March 9, 1954. 17 leaves. DP

A device is described which provides ejection through the bottom of an aircraft fuselage along a predetermined direction, at an initial translational speed low enough to avoid damage to the airman, but sufficiently high to avoid collision with the plane. The ejector consists of a seat adapted to be rotated backwards from a normal seated position to a position in which the pilot's head is directed downward, and from which he may be ejected through a passage leading outside the fuselage.

4903
Savve, V. D.
[RATE OF HEMOGLOBIN IRON RESTORATION IN OXYGEN DEFICIENCY] Skorost' obnovleniîa zheleza gemoglobina pri kislorodnom golodanii. — Biokhimiîa (Moskva), 20 (3): 346-352, May-June 1955. In Russian, with English summary (p. 353). DLC (QH301.A343, v. 20)

Tests with rabbits indicated that the changes in the hemoglobin content in the peripheral blood in hypoxia were not the reflection of changes in the intensity of the hemopoietic processes which are normally observed in experiments with radioactive iron. Under normal conditions, the rate of iron turnover in the bone marrow increased severalfold in anoxia: as a consequence the rate of hemoglobin iron turnover persisted for a time after exposure to low oxygen had been discontinued.

4904
SC-54S UPDATE AF RESCUE SERVICE, CUT COSTS. — Amer. Aviation, 19 (15): 41. Dec. 19, 1955. DLC (TL501.A675, v. 19)

Newly fitted SC-54 transports have been introduced by the U. S. Air Force Air Rescue Service to provide coverage beyond the coastal range of the Grumman SA-16. The new aircraft are more economical and will carry more rescue kits than the previously used SB-17 and SB-29 converted bombers.

4905
Scano, A.
[THE CONTRIBUTION OF ELECTRONICS TO RESEARCH IN THE FIELD OF AVIATION MEDICINE] Il contributo dell'elettronica alle richerche nel campo della medicina aeronautica. — Rivista di medicina aeronautica (Roma), 18 (4): 947-959. Oct.-Dec. 1955. In Italian, with English summary (p. 957-958). DLC (TL555.A1R5, v. 18)

A brief review is presented of the basic effects of flight on the human body, followed by an outline

of the physiopathology of human flight in relation to electronic research methods and equipment. The methods most commonly used in aviation medicine are described (oximetry, gas analysis, tele-electrocardiography) along with neuro- and psychophysiological apparatus. Discussion is included on the electronic equipment used in planes for the continuous physiological control of flight personnel efficiency. (Author's summary, modified)

4906
Scano, A.
[MEASUREMENT OF OXYGEN TENSION IN THE TISSUES] La misura della tensione di O_2 nei tessuti. — Rivista di medicina aeronautica (Roma), 18 (2): 373-395. April-June 1955. In Italian, with English summary (p. 393).
DLC (TL555.A1R5, v. 18)

A review is presented of the methods used in measuring oxygen tension in the tissues, with special emphasis on the polarographic method. Included are technical data and up-to-date results. (25 references)

4907
Scano, A., F. Rossanigo, G. Meineri, B. Tagliamonte, and G. P. Ghinozzi
[RESULTS OF SOME RESPIRATORY AND CARDIOVASCULAR FUNCTION TESTS PERFORMED ON FLIGHT PERSONNEL] Risultati di alcuni esami funzionali respiratori e cardio-circolatori eseguiti su personale aeronavigante. — Rivista di medicina aeronautica (Roma), 18 (3): 559-582. July-Sept. 1955. In Italian, with English summary (p. 579-580).
DLC (TL555.A1R5, v. 18)

The following results were obtained from respiratory and cardiovascular function tests performed on 100 young jet pilots: The vital capacity showed an average value of 4637 ± 482 cc., and the Flack test an average time of 69.2 ± 17.8 seconds. During cyclo-ergometric exercise, the pulmonary ventilation increased by 322%, the oxygen consumption by 468%, the ratio between calories produced and liters of air breathed and the ratio between mechanical work produced and energy expended were augmented, and the pulse rate increased by 74%. During decompression to 3000 meters, pulmonary ventilation increased 4.1%, at 5500 meters 3.8%; hyperventilation displayed by a majority of subjects decompressed to 5500 meters produced acapnia with consequent renal elimination of alkaline radicals and an increase in urinary pH; decompression increased the pulse rate at 3000 m. by 7.0%, and at 5500 m. by 23.6%.

4908
Scarpelli, E. M.
PHYSIOLOGICAL TRAINING. — School of Aviation Medicine, Gunter Air Force Base, Ala. vi+269 p. May 1955. DLC (RC1075.U54)

A textbook is presented designed as a study reference for students of physiological training at the Air Force School of Aviation Medicine, Gunter Branch, Alabama. Information on physiological principles is presented in chapters titled the atmosphere; physiology of respiration and circulation; hypoxia; hyperventilation; decompression sickness; acceleration; night vision; noise and vibration; pressure cabins and decompression; and pressure breathing. A section on survival equipment deals with oxygen systems; the partial pressure suit and accessories; the P-3 helmet; oxygen cylinders; ejection seat training; emergency escape at altitude; and night vision training. Also included are chapters on operation of a physiological training unit and reference guides.

4909
Schaefer, H. J. 1952
EXPOSURE HAZARD FROM COSMIC RADIATION AT EXTREME ALTITUDE AND IN FREE SPACE. — In: Probleme aus der astronautischen Grundlagenforschung [International Astronautical Congress, 3rd (Stuttgart, 1952), Proceedings], p. 201-210. Stuttgart, 1952. In English.
DLC (TL787.I44, 3rd, 1952)

Same as item no. 753, vol. I.

4910
Schaefer, H. J.
BIOLOGICAL SIGNIFICANCE OF THE NATURAL BACKGROUND OF IONIZING RADIATION: OBSERVATIONS AT SEA LEVEL AND AT EXTREME ALTITUDE. — Jour. Aviation Med., 26 (6): 453-461. Dec. 1955. DLC (RC1050.A36, v. 26)

The author attempts to compare the effects of ionization on living tissues produced by background radiation at sea level with that which is produced by the primary cosmic radiation at the top of and outside the atmosphere. At sea level, 300 microroentgens per 24 hours is produced by electrons and alpha particles; this sea-level dosage in cellular tissue can be accurately analyzed. Cells exposed to peak dosages in the range of 30 rep/cell will probably be seriously affected. A similar analysis applied to the primary cosmic radiation results in maximum dosage values in the range of 3000 rep/cell. Damage from such radiation levels is likely to be severe; yet, considerable difficulties exist for experimentally tracing and identifying such ionization events in test animals. The author uses the human embryo for theoretically assessing the quantity of damage to be expected from primary cosmic radiation. He states that one hit by a heavy primary of cosmic radiation for approximately 200 hours of flight per embryo will produce a group of cells within the total cell mass of about one million (in a young embryo) which will have a high radiation exposure.

4911
Schaefer, H. J.
GRAPHS AND TABLES FOR THE HIT FREQUENCIES FROM HEAVY NUCLEI OF THE PRIMARY COSMIC RADIATION. III. STATISTICAL VARIATION OF HIT FREQUENCIES IN A POPULATION OF EXPOSED SPECIMENS. — Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 101 100.10, Feb. 1955. [19] p.
AD 61 399 PB 118888

The report gives a brief derivation of the Poisson distribution interpreting it in terms of a population of biological specimens exposed to heavy nuclei bombardment of the primary cosmic radiation. It supplements three preceding reports by presenting graphs and formulae from which the statistical variance of the hit frequencies for any special experimental system and altitude and duration of exposure can be read. The application to expo-

sures of large numbers of microscopic targets is discussed in particular and the consequences for a reasonable experimental technique are pointed out. (Author's abstract)

4912
Schaefer, H. J.
GRAPHS AND TABLES FOR THE HIT FREQUENCIES FROM HEAVY NUCLEI OF THE PRIMARY COSMIC RADIATION. IV. ISO-INTENSITY CHARTS FOR HIGH-ENERGY HEAVY NUCLEI WITHIN A STANDARD SPHERE (MAN). — Naval School of Aviation Medicine, Pensacola, Fla. Dec. 20, 1955. iii+[29] p. (Research Project no. NM 001 101 100, Report no. 11). AD 96 377 UNCLASSIFIED

The system investigated was that of a 52 cm. diameter sphere consisting of a material of density 1 and of a mean atomic number of 7 exposed on top of the atmosphere to the full hemispheric intensity of the primary cosmic radiation. The number of transversals of heavy nuclei through each point within the sphere were scored per unit time, and on the basis of these data isointensity charts of the 4 components of the heavy spectrum (carbon-nitrogen-oxygen (CNO), Z=7; Mg, Z=12; Ca, Z=20; Fe, Z=26) were set up. The charts show that the penetrating power of the heavy components of the primary cosmic radiation is such that, in an absorber of the size and composition of the human body, a marked decrease in radiation intensity occurs from the surface to the interior. The total administered dose to the human body from the heavy components is substantially less than the skin dose. The former is 58% of the latter for the CNO group and 38% for the Fe group. (AD abstract)

4913
Schaefer, H. J.
PROTECTION OF HUMANS FROM HEAVY NUCLEI OF COSMIC RADIATION IN REGIONS OUTSIDE THE ATMOSPHERE. — Astronautica acta (Wien), 1 (2): 100-109. 1955. In English.
DLC (TL787.I46, v. 1)

The physics and biophysics of the heavy nuclei of primary cosmic radiation are reviewed in the light of recent information concerning the biological effects of the heavy component. Protection from the heavy nuclei by shielding is deemed infeasible even in the case of a large rocket ship due to excessive weight of the shielding material required to achieve an effective reduction of the biological dosage at least below the range of the natural variability. Inadequate shielding increases the exposure hazard by increasing the hit numbers of maximum ionization. However, there is a statistical chance factor involved, therefore the heavy nuclei hazard for the individual crew member may be regarded as similar to the meteorite hazard for the entire ship. It is expected, that the performance of the crew will not be affected, since even severe radiation damage develops only after weeks or months have elapsed.

4914
Schaefer, K. E.,
C. T. G. King, J. L. Mego, and E. E. Williams
EFFECT OF A NARCOTIC LEVEL OF CO_2 ON ADRENAL CORTICAL ACTIVITY AND CARBOHYDRATE METABOLISM. — Amer. Jour. Physiol., 183 (1): 53-62. Oct. 1955. DLC (QP1.A5, v. 183)

Normal unanesthetized guinea pigs and normal, adrenalectomized, and hypophysectomized rats were exposed to 30% CO_2 in air and in O_2 for a period of 1 hour, followed by a 1 hour recovery period in air. Both CO_2 mixtures produced a severe acidosis in guinea pigs, superimposed in the case of 30% CO_2 in air by hypoxia. The blood CO_2 content remained high after recovery, while pH returned to a normal level. Exposure to 30% CO_2 in air, but not in O_2, produced an increased adrenal cortical activity, indicated by a decrease in adrenal cholesterol and circulating lymphocytes, and an increase in adrenal weight. Plasma potassium and sodium, blood glucose, and blood eosinophils increased in both groups, while liver glycogen decreased and the total number of leucocytes remained unchanged. Muscle glycogen increased and lactic acid decreased under 30% CO_2 in air, with the opposite condition occurring under 30% CO_2 in O_2. Blood sugar in normal, adrenalectomized, and hypophysectomized rats increased significantly during exposure to both CO_2 mixtures. The increase of blood sugar in the case of adrenalectomized rats, and the decrease of liver glycogen in guinea pigs during and after exposure to 30% CO_2 suggests an inhibition of the "vago-insulin system" under high CO_2 concentrations. (Authors' summary, modified)

4915
Scher, S. H.
PILOT'S LOSS OF ORIENTATION IN INVERTED SPINS. — National Advisory Committee for Aeronautics, Washington, D. C. NACA Technical Note 3531, Oct. 1955. 10 p. DLC (TL521.A35, no. 3531)

The pilot's loss of orientation during spins, especially during unintentional inverted spins, is a rising psychological problem and has led to accidents and near-accidents with both trainer and fighter airplanes during acrobatic maneuvers and after recovery from erect spins. Discussion is presented on the nature of inverted spins, the optimum control technique for recovery, and reasons for the pilot's loss of orientation (oscillatory nature of spin, rapid change of the airplane's attitude during recovery). Illustrations are included of a spin-simulator rig in which research personnel and pilots can be strapped and be rotated in erect or inverted-spin attitudes.

4916
Schiavone, E. L.
[SOME CONSIDERATIONS ON THE WATER SUPPLY OF AIRPLANES: TREATMENT AND CONTROL OF THE BACTERIOLOGICAL QUALITY] Algunas consideraciones sobre el agua de provisión para aviones: tratamiento y fiscalización de su calidad bacteriológica. — Semana médica (Buenos Aires), 107 (17): 735-745. Oct. 27, 1955. In Spanish.
DNLM

The airplane's water supply is examined with reference to the (1) type of containers used at the airport prior to the transfer of water into the plane, and the type of water tank utilized on the plane, and (2) methods of cleaning tanks, handling the water supply, and sterilizing water receptacles with emphasis on those used for drinking and washing. Discussion is included on the methods of bacteriological control in the water supply.

4917
Schindl, K.
[AIRSICKNESS: NATURE AND SYMPTOMS, PREVENTION AND TREATMENT] Luftkrankheit, Wesen und Zeichen, Prophylaxe und Therapie. — Jahrbuch der Wissenschaftlichen Gesellschaft fur Luftfahrt (Braunschweig), 1954, p. 178-183. 1955. In German, with English summary (p. 183).
DLC (TL503.W5563, v. 1954)

Air sickness as a type of motion sickness unfolds a symptom complex characteristic of disturbed autonomic balance in the direction of parasympathicotonia. Passive motion in the form of linear vertical, radial, and angular accelerations in flight sends conflicting and irritant stimuli to the vestibular receptors of the inner ear. Primary effects include disturbances of the gastrointestinal and cardiac functions originating from the vegetative centers of the brain area. Afferent impulses to the diencephalon result in secondary effects in the psychic and motor spheres. Constitutional and psychologic factors which predispose an individual to motion sickness are discussed in regard to selection of flight personnel. The use of pharmaceutical agents including hibernants and vitamin B_6 is considered in the prevention and treatment of airsickness of passengers and flight crew separately.

4918
Schoedel, W.
[DANGERS OF SYSTEMIC COOLING] Gefahren bei allgemeiner Auskühlung. — Acta neurovegetativa (Wien), 11 (1-4): 60-71. 1955. In German, with English summary (p. 68-69). DNLM

The effects of hypothermia on the blood circulation, tissue oxygenation, and metabolic processes of the whole organism and of individual organs are discussed. Hypothermia is less dangerous to organs at rest than to organs in which stimulative processes take place. Pharmacological inhibition of stimuli emanating from the central nervous system helps to raise the organism's resistance to hypothermia. Animals with well developed temperature regulation have lower tolerance to hypothermia. The chief danger of injury from excessive stimulation lies in the rewarming process. Thermal changes are particularly disturbing to cardiovascular, endocrine, and central nervous system functions.

4919
Schoeffler, M. S.
THE AMOUNT OF INFORMATION PRESENTED AS A PARAMETER OF TRACKING PERFORMANCE. — Army Medical Research Lab., Fort Knox, Ky. Report no. 197, June 29, 1955. ii+[14] p. (Project no. 6-95-20-001). AD 64 626 UNCLASSIFIED

The experiment was performed relating the amount of information that a subject receives concerning the position of a target to time-on-target scores in a compensatory tracking task. The results showed that improvement in tracking is related to the amount of information presented. All groups that received any information showed significant improvement in tracking, the improvement being most pronounced in a group that received an intermediate degree of information. (Author's abstract)

4920
School of Aviation Med. (U. S. Navy)
SYMPOSIUM ON PHYSIOLOGICAL PSYCHOLOGY. — Issued by Office of Naval Research, Washington, D. C. ONR Symposium Report no. ACR-1, March 10-11, 1955. 302 p. AD 80 100 UNCLASSIFIED

The aeromedical papers presented at this symposium have been abstracted separately, see items no. 3814, 3877, 4153, 4201, 4225, 4284, 4390, 4566, 4701, 4769, 4854, 5062, 5158, and 5206.

4921
Schreuder, O. B.
[THE AGING PILOT] Le pilote qui prend de l'âge. — Médecine aéronautique (Paris), 10 (1): 37-41. 1955. In French. DLC (TL555.M394, v. 10)

In a discussion of the flying capability of the aging pilot, it is suggested that the physical deterioration of the pilot may often be compensated for by the use of instruments, and in any case, can not be determined by arbitrary measures of age.

4922
Schreuder, O. B.,
and J. G. Constantino
TRANSPORTATION OF PATIENTS BY COMMERCIAL AIRLINES. — Jour. Aviation Med., 26 (3): 184-188. June 1955. DLC (RC1050.A36, v. 26)

With very few exceptions, any sick person who can travel can fly. In those instances where it is necessary that the ill must travel moderate to great distances, air transportation is the method of choice because of its speed, efficiency, and greater degree of comfort and safety. In transporting patients by air, by regularly scheduled flights, the risk to the health and security of fellow passengers by the contagious and mental cases must be taken into consideration. These conditions, however, do not apply when transportation is accomplished by chartered aircraft. The advent of pressurized aircraft as utilized today by the major airlines has greatly simplified the problem of air transporation of sick individuals. (Authors' summary)

4923
Schubert, E. D.
BASIC RESEARCH IN PSYCHOACOUSTICS. — State Univ. of Iowa, Iowa City (Contract DA-36-039 SC-63144). Third Quarterly Progress Report, June 30, 1955. (SC Project no. 132B, DA Project no. 3-99-12-022). 9 p. AD 67 693 UNCLASSIFIED

A brief description is given of research conducted on natural sidetone, amplified sidetone, the audio-spectrometer, and binaural time differences. Preliminary findings suggest that: (1) strong components of body-conducted side-tone are present up to as high as 2000 cycles; (2) presentation of amplified delayed sidetone out of phase does not increase intelligibility; and (3) binaural time disparity of 200 microseconds to 3 milliseconds increases intelligibility.

4924
Schubert, E. D.,
and R. Seibel
BASIC RESEARCH IN PSYCHOACOUSTICS. — State Univ. of Iowa, Iowa City (Contract DA 36-039

SC-63144); issued by Signal Corps Supply Agency, Fort Monmouth, N. J. Final Report, Sept. 30, 1955. iv+36+11 p. (SC Project no. 132B). AD 84 719 UNCLASSIFIED

Research was accomplished on (1) the measurement of body vibrations during speech and of body-conducted sidetone; (2) amplified sidetone; (3) binaural time disparity and intelligibility; and (4) the construction of an audio spectrometer. A transducing system is being designed to explore the characteristics of body vibrations during speech. The vowel [i], produced at a sound pressure level of 90 db., resulted in a body-conducted sidetone of a pressure level of 44-54 db. for frequencies of 100 to 2000 c.p.s., and less than 29 db. at 4000 c.p.s. The results of changing phase and relative level of delayed sidetone indicated that the measured amount of interference was increased by increasing the relative level of the delayed signal. The out-of-phase condition yielded more interference, for a given level, than the in-phase condition. Amplified direct sidetone was found to be useful in combating delayed sidetone. Under difficult listening conditions improvement accompanied the introduction of a time interval between the ears. The improvement was greater for continuous material and reached a maximum around 500 μsec. The antiphasic condition afforded about the same improvement as the maximum delay. (AD abstract, modified)

4925
Schubert, E. D.
SOME PRELIMINARY EXPERIMENTSON BINAURAL TIME INTERVAL AND INTELLIGIBILITY. — State Univ. of Iowa, Iowa City. Supplementary Report no. 1, Sept. 20, 1955. v+26 p. (Signal Corps Contract DA 36-039 sc-63144). AD 75 173 UNCLASSIFIED

Experiments were run to determine the effect on intelligibility in noise of having a speech signal arrive at one ear earlier than the other. The intervals employed ranged from 200 microseconds to 7 milliseconds. Materials employed included individual monosyllabic words and simple continuous material. For each kind of material a listening condition was included with one headphone 180 degrees out of phase with the other. This affords a comparison of this simple condition with the various time intervals tested. The results on individual words are somewhat equivocal, but do indicate that under difficult listening conditions, i.e., low signal-to-noise ratios, improvement accompanies the introduction of a time-interval between the ears. For continuous material, this improvement is greater and appears to reach a maximum around 500 microseconds. The antiphasic condition (one ear out of phase) affords about the same improvement as the maximum delay. (From the author's summary)

4926
Schubert, G
[THE PHYSIOLOGICAL BARRIERS IN MODERN AERONAUTICS] Die physiologischen Barrieren im neuzeitlichen Flugwesen. — Schweizerische medizinische Wochenschrift (Basel), 85 (17): 400-402. April 23, 1955. In German. DNLM

The various physiological limitations of flight are enumerated. Two of these, the altitude and the pressure barriers, have been overcome some time ago; they play a role only in the aviation-accident research. The acceleration barrier, however, has proven to be as insurmountable an obstacle as the optic barrier. The latter is created by the response latency of the eye and, in practice, results in a blind zone in front of the pilot's eyes, the depth of which is proportional to the flight speed. This zone makes the human operator unsuitable for the execution of tactical problems in high-speed aircraft. High altitude flights in the upper atmosphere are endangered by the cosmic radiation barrier.

4927
Schwab, R. S.
THE NONLABYRINTHINE CAUSES OF MOTION SICKNESS. — Internat. Record Med., 167 (12): 631-637. Dec. 1954. DLC (R11.M745, v. 167)

Nonlabyrinthine factors causing motion sickness include (1) olfactory; (2) visual; (3) psychic or emotional, including conditioning of various types; and (4) miscellaneous, consisting of menstruation, duodenal ulcer, and the aggravating effects of overindulgence before travel. Awareness of these causes is considered in plans for the prevention and treatment of motion sickness.

4928
Schwan, H. P.
APPLICATION OF UHF IMPEDANCE MEASURING TECHNIQUES IN BIOPHYSICS. — Univ. of Pennsylvania. Moore School of Electrical Engineering, Philadelphia [Contract Nonr 55 105]. Technical Report no. 15, 1955. 14+9 p. AD 56 691 PB 120044

Discussions are presented to familiarize the ultrahigh frequency engineer with the application of UHF measuring techniques in biophysics. The following topics are considered: (1) health hazard associated with electromagnetic radiation, (2) electromagnetic radiation diathermy, (3) electromagnetic radiation for cooking purposes, (4) internal resistivity of the cellular organism, and (5) instrumentation requirements. (AD abstract)

4929
Schwichtenberg, A. H.
IS IT WORKING? — Flying Safety, 11 (3): 12-13. March 1955. DLC (UG633.F43, v. 11)

A field test was conducted with 29 pilots to determine the condition of their oxygen equipment and their flight performance in unpressurized cabins. None of the pilots were aware of the nature of the mission or the lack of pressurization. The flights involved steep turns and at least 30 min. flight at 30,000 ft. altitude to allow time for development of hypoxic symptoms. Slightly more than 10% of those tested experienced hypoxic symptoms. Most frequent conditions were malfunctioning of the oxygen apparatus due to dirt particles in the mask valves, insufficient training in the use and care of oxygen equipment, and a lack of timely recognition of symptoms of hypoxia.

4930
SCOTLAND'S AIR AMBULANCES.— Flight (London), 67 (2410): 428-429. April 1, 1955. DLC (TL501.F5, v. 67)

The Scottish Air Ambulance Service, operated by British European Airways for the National Health

Service, is briefly described. Two new Herons equipped with stretchers and carrying volunteer nurses have been introduced to transport patients from outlying areas on a call basis.

4931
Scott, D. M.,
G. S. Machen, and C. H. Baker
PERCEPTUAL PROBLEMS IN ESTIMATING RANGE AND BEARING FROM PPI OVERLAYS. — Defence Research Medical Labs. (Canada), Toronto, Ontario. DRML Report no. 163-1, Jan. 1955. vii+23 p. (DRML Project no. 163-134-55). AD 65 131 UNCLASSIFIED

When estimating the bearings of pips to the nearest degree from a projected plan-position indicator (PPI) overlay, 12 radar operators were found to produce negligible variable and constant errors. Confusion errors numbered about 3% of total errors as compared with about 1% when estimating range. All types of errors were found to increase as bearing lines converged, and as viewing distance from the 32-inch display increased from 24 to 192 inches. The bearing of pips was found to have no effect upon accuracy of bearing estimation. When operators made errors they exhibited a strong tendency to make them in the direction of the nearest bearing marker. (From the authors' conclusion)

4932
Scott, J. W.
THE EEG DURING HYPOTHERMIA [Abstract]. — Electroencephalography and Clinical Neurophysiol., 7 (3): 466. Aug. 1955. DNLM

Electroencephalograms were recorded from 25 anesthetized patients during hypothermia (to 28° C.) for brain surgery, and during rewarming. In the anesthetized patient prior to cooling there usually was a dominant rhythm at about 6 cycles/sec. with a voltage of 60-80 μV. As the brain temperature fell there was a general lowering of the voltage to 50 μV. The beta activity was no longer present, but alpha activity sometimes persisted. Below 30° C. the voltage dropped and the record became more irregular, but the electrical activity was not completely suppressed. Cerebral anemia produced by occlusion of brain arteries had little effect on the EEG for at least 12 min. In some cases delta waves of the same voltage as the dominant rhythm were seen after 8 min. of anemia. (From the author's abstract)

4933
Scribner, K. J.
AIRPORT QUALIFICATION VIA WIDE-SCREEN FILM. — Skyways, 14 (1): 6-7, 48. Jan. 1955. DLC (TL501.S634, v. 14)

A wide-scope color film of the approach to LaGuardia airport has been experimentally produced by Pan American Airways to substitute for the airport qualifying flight now required by the Civil Aeronautics Board. The film presents a pilot's view of the landing approach, and is accompanied by a continuous narrative describing features of the airport. A portion of the narrative is reproduced here.

4934
Sehgal, J. K.
EPIDEMIOLOGY OF AIR TRAVEL. — Aero Med. Soc. Jour. (New Delhi), 2 (1): 19-25. April 1955. DNLM

The following topics are included in a discussion on the epidemiology of air travel: aircraft as a carrier of disease; international control over the spread of infection by air travel; disinfection (5% formaline spray) of aircraft; disinfestation (aerosol containing 2% pyrethrum extract, 2% DDT in freon base) of aircraft; international health certificates; and aircraft health clearing procedure on arrival and on departure.

4935
Sells, S. B.
DEVELOPMENT OF A PERSONALITY TEST BATTERY FOR PSYCHIATRIC SCREENING OF FLYING PERSONNEL. — Jour. Aviation Med., 26 (1): 35-45. Feb. 1955. DLC (RC1050.A36, v. 26)

The development of a psychiatric screening test battery depends on predictors and criteria. The author lists the developments which have been made on screening techniques: ratings by classmates proved the most valid predictors in assessing later combat performance of pilots; a positive correlation has been found between the absence of pathological behavior as determined by field teams of psychologists and combat success; however, it has also been found that pilots with superior training averages tend to have more accidents; a "purified pass-fail criterion" which takes into account adjustment or its lack on the part of the student has shown a high degree of validity when compared with actual administrative records. Predictor traits which are favorable for the candidate flyer are: agressiveness, masculinity, dominance, gregariousness; interests in flying, hot rods, mechanical, scientific, and military matters; acceptance of standard mores, and submission to authority. Control of anxiety is a prime requisite. Further developments of predictors of pilot performance involve measurement of motivation by questionnaires and projective techniques, and measurement of anxious disposition. Two physiologic tests which have shown great promise in the measurement of anxious disposition are the electroencephalographic response to flickering light and the conditioned galvanic skin response to electric shock.

4936
Sells, S. B.,
J. R. Barry, D. K. Trites, and H. I. Chinn
A TEST OF THE EFFECTS OF PREGNENOLONE METHYL ETHER ON SUBJECTIVE FEELINGS OF B-29 CREWS AFTER A TWELVE-HOUR MISSION. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-11, May, 1955. 7 p. AD 69 500 PB 118444

Pregnenolone methyl ether has been reported in the literature as having favorable effects, with psychiatric patients, on subjective reactions of fatigue, irritability, anxiety, and fear. Student B-29 crews were administered this drug or a placebo, in a balanced design, immediately after completing an all-night, overwater mission, to determine whether similar effects might be produced in normal bomber crew personnel. A battery of psychological tests was administered twice to both groups, by crew, with an interval of from 63 to 94 minutes between pre-drug and post-drug test periods. No significant differences were found between drug

and placebo groups, although the changes observed support the validity of the tests. (Authors' abstract)

4937
Senders, J. W.,
J. M. Christensen, and R. Sabeh
COMPARISONS OF A SINGLE OPERATOR'S PERFORMANCE WITH TEAM PERFORMANCE ON A TRACKING TASK. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-362, July 1955. iii+5 p. (Project no. 7182).
AD 96 355 PB 123178

The performance of a two-man team, each member of which is responsible for one dimension of a two-dimensional tracking task, is compared with that of one man performing the entire task. In addition, the effects of knowledge of the partner's performance are investigated for the two-man situation. Using time-on-target as a criterion, the results show that (1) the two-man team obtains a score two or three hundred percent better than that obtained by the single man, and (2) knowledge of partner's performance has little or no effect on an individual's performance. (Authors' abstract)

4938
Senders, J. W.,
I. B. Webb, and C. A. Baker
THE PERIPHERAL VIEWING OF DIALS. — Jour. Applied Psychol., 39 (6): 433-436. Dec. 1955.
DLC (BF1.J55, v. 39)
Also advance abstract in: Amer. Psychologist, 8 (8): 433. DLC (BF1.A55, v. 8)

The ability of subjects to see pointer position for four types of pointers at peripheral angles from 10° to 80° has been investigated. No significant differences exist among the pointers used in this experiment. If reversal errors are ignored, the ability to discriminate pointer position when the dial is displaced as much as 40° from the fixation point is good. Even at 80° of displacement pointer position readings are better than chance. (Authors' summary)

4939
Senders, V. L.,
J. Cohen, and M. Arginteanu
THE EFFECTS OF ABSOLUTE AND CONDITIONAL PROBABILITY DISTRIBUTIONS ON INSTRUMENT READING. II. A COMPARISON OF A LINEAR AND A LOGARITHMIC SCALE. — Antioch Coll., Yellow Springs, Ohio (Contract AF 18(600)-50); issued by Wright Air Development Center, Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 54-253, Part 2, July 1955. iv+33 p. (Project no. 7186, Task no. 71545).
AD 95 233 PB 130406

The readability of a logarithmic scale was compared with that of a linear scale. Pointer settings were grouped into sequences of nine settings each, increasing either linearly or logarithmically. When grouped, settings from linear sequences formed a frequency distribution which was approximately rectangular; settings from the logarithmic sequences formed a positively skewed distribution. The same settings were also presented on both scales. The stimuli were presented tachistoscopically for exposures of .8 sec. When error is expressed in scale units, the linear scale is superior to the logarithmic, the skewed distribution to the rectangular, and the regular order to the random. The use of a regular order improves performance more on the logarithmic scale than on the linear. In terms of angular deviation of response from settings, the logarithmic scale is not significantly different from the linear scale. The use of a logarithmic scale is recommended where (1) tolerance is a constant percentage of the indication; and (2) many pointer settings occur in a low end of the scale range and it is desired to minimize average error in scale units. (From the authors' abstract)

4940
Senders, V. L.,
and J. Cohen
EFFECTS OF SEQUENTIAL DEPENDENCIES ON INSTRUMENT-READING PERFORMANCE. — Jour. Exper. Psychol., 50 (1): 66-74. July 1955.
DLC (BF1.J6, v. 50)

An experiment was conducted to determine the effect of sequential dependencies among the pointer settings used as stimuli on scale-reading performance. A hundred subjects were presented with ten repeated successive exposures of each of 50 stimuli. Forty control subjects received the same stimuli in an unordered sequence. An information analysis and an error analysis were performed on the data. Mere unordered repetition of stimuli results in only a slight increase in information transmitted. Successive exposure of the same stimulus results in a marked negatively accelerated increase in information transmitted by a set of such stimuli, and in a marked decrease of mean square error. The amount of information transmitted is affected by the scale design, exposure time, and their interaction. The correlation between the logarithm of the error measures and the information measures was -.86. The implications of these findings for research methodology in the area of instrument and dial design are discussed. (Authors' summary, modified)

4941
Senecal, T. L. 1954
SOME ASPECTS OF AIRCRAFT NAVIGATION DISPLAY USING GROUND TRACK INFORMATION. — In: Airborne electronics digest, 1954 (National Conference on Airborne Electronics, Dayton, 1954), p. 113-117. DLC (TL693.A3, 1954)

The indicator ID-386/APA is described as an example of an integrated display of flight control and navigation information. It includes a rotating azimuth scale to display ground track, a rotating pointer to display course to destination, and a counter type of display to indicate distance to destination. The advantages and disadvantages of the use of the ground track display as compared to use of heading display for pilot steering and situation information are discussed.

4942
Setter, L. R.,
and C. E. Whitfield
THE EVALUATION OF DEODORANTS FOR USE IN AIRCRAFT CHEMICAL TOILETS. — Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio

(Contract D. O. 33(616)-54-10); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-332, Aug. 1955. v+36 p. (Project no. 6356-63159). AD 113 242
UNCLASSIFIED
B-18
LDD/rk:jtl 1955

The immediate objective of this study was to select deodorant chemical formulations best suited for use in aircraft chemical toilets, with the ultimate objective of developing a group of minimum performance characteristics for deodorant chemicals acceptable to the U. S. Air Force. An air-dilution technique obtaining threshold odor values leading to odor control factors was found to be the most satisfactory method for deodorant evaluation. This technique utilized an osmometer developed especially for the purpose. Olfactory anesthesia and the masking power of deodorants are two other important parameters than can be readily evaluated with the osmometer. These three indices along with ancillary tests on shelf stability, corrosivity to aluminum, suitability of packaging, etc., would provide the necessary minimum performance characteristics exclusive of an evaluation of the disinfecting power.

4943
Shaw, M. E.
A COMPARISON OF TWO TYPES OF LEADERSHIP IN VARIOUS COMMUNICATION NETS. — Jour. Abnormal and Social Psychol., 50 (1): 127-134. Jan. 1955. DLC (RC321.J7, v. 50)

Experimental investigation of the effects of authoritarian and nonauthoritarian leadership on the performance and morale of small groups in various communication nets led to the following conclusions: (1) both types of leadership affect group performance and morale by their effects on group independence and saturation, and that morale is affected relatively more by the degree of independence, while performance is affected relatively more by saturation; (2) authoritarian leadership produces better performance and lower morale than nonauthoritarian leadership.

4944
Sheer, D. E.,
and P. Worchel
CONFIGURATIONAL CONSTANCY. I. THE EFFECTS OF CHANGES IN THE INTRINSIC ELEMENTS. — Jour. Gen. Psychol., 53 (2): 265-280. Oct. 1955. DLC (TL1.J64, v. 53)

Spatial orientation in terms of geographical location and identification of targets in an important problem for the pilot or navigator, as it involves the ability to organize geographical objects or representations of these objects into a topographical schema or "mental map". In the transposition of a configuration from the radar scope or landmarks to a chart, the individual components may undergo distortion, although the configuration remains constant. The present study indicates that changes in orientation, distance between elements, size, and form of the elements in that order, produce a significant decrease in the ability to recognize the configuration. The low positive intercorrelations suggest that modification of each produces in effect a different situation. Individual variations are greater when the stimulus conditions are less stable or more ambiguous. (From the authors' summary)

4945
Shephard, R. J.
ARTERIAL FLOW THROUGH THE LIMBS DURING PRESSURE-BREATHING: EVIDENCE FROM INTRAMUSCULAR THERMOCOUPLES. — R. A. F. Inst. of Aviation Medicine (Gt. Brit.), Farnborough; issued by Flying Personnel Research Committee. Report no. FPRC 939, Dec. 1955. 13+7 p.
AD 84 374 UNCLASSIFIED

Intra-muscular temperature changes were recorded in subjects clothed in a counter-pressure garment during pressure breathing at 40 to 107 mm. Hg. Insertion of a needle thermocouple in the brachio-radialis muscle revealed a considerable initial increase in temperature which was apparently proportional to the magnitude of applied pressure. With continued pressure breathing a rapid decrease in temperature to normal or below-normal levels was observed. The indicated decrease in blood flow suggests an increase in peripheral vascular tone despite the persistence of increases in transmural pressure. The collapse occurring during prolonged pressure breathing cannot therefore be attributed to disturbances in peripheral vascular tone.

4946
Shephard, R. J.
THE EVALUATION OF A NULL-POINT DISCONTINUOUS ELECTRICAL PURSUIT METER. — Flying Personnel Research Committee (Gt. Brit.). FPRC no. 928, Aug. 1955. [17] p. AD 75 843
UNCLASSIFIED

Description is given of a null-balance electrical pursuit meter based on a Wheatstone bridge circuit. Evaluation of a group of normal subjects shows that it is capable of yielding repeatable measurements of an "initial response time" and a "total response time" for coordinated manual tasks of the type encountered in flying an aircraft. Possible applications include addition and subtraction problems, code substitution tests, and measurements of inhibition and contrast discrimination. With suitable adjustment the apparatus is capable of testing other psychological functions and visual contrast discrimination. It is recommended that the apparatus should be tested under conditions of psychological stress. (From the author's summary)

4947
Shephard, R. J.
THE IMMEDIATE METABOLIC EFFECTS OF BREATHING CARBON DIOXIDE MIXTURES. — Jour. Physiol. (London), 129 (2): 393-407. Aug. 29, 1955. DLC (QP1.J75, v. 129)

The effects on oxygen consumption of breathing 5% carbon dioxide in air for up to 5 minutes were studied in three subjects. An observed increase above the estimated increase in oxygen consumption is attributed to an early elevation of cardiac output consistent with a slight increase in pulse rate and a normal or slightly increased systemic blood pressure, an increase of 25% in cardiac work, and, to a smaller extent, to the mechanical work of hyperventilation.

4948
Shephard, R. J.
THE PLACE OF THE PNEUMATOGRAPH IN THE MEASUREMENT OF BREATHING CAPACITY. — Flying Personnel Research Committee (Gt. Brit.), Report no. FPRC 916, May 1955. 19 p. AD 68 434
UNCLASSIFIED

The physical characteristics of a pneumograph system suited to the investigation of breathing capacity are described. A trial of the apparatus on 8 normal subjects yielded maximum breathing capacity values similar to those previously reported for low-resistance systems. Wide personal variation was noted in the optimum respiratory rate for the performance of the maximum breathing capacity test, and most subjects showed some decline of maximum inspiratory velocity during the last few seconds of the test. The fast vital capacity tracings do not always conform to smooth exponential curves. Owing to the speed of delivery the volume delivered is less than the true vital capacity, particularly during inspiration. Although theoretical grounds suggest the prediction of the maximum breathing capacity from a 30 second fraction of the vital capacity tracing, in practice a better correlation is obtained from the entire fast inspiratory and expiratory vital capacity curves. This anomaly appears related to the considerable variations of peak gas velocity during the performance of vital capacity tests. (From the author's summary)

4949
Shephard, R. J.
RESPIRATORY RESPONSES TO THE INHALATION OF OXYGEN AT ATMOSPHERIC PRESSURE IN NORMAL SUBJECTS AND IN CASES OF CONGENITAL HEART DISEASE. — Jour. Physiol. (London), 127 (3): 498-514. March 28, 1955.
DLC (QP1.J75, v. 127)

Respiratory response to 30-minute periods of 100% oxygen breathing was studied in two normal subjects and twenty-eight subjects with congenital heart desease. Normal subjects showed an increased respiratory minute volume consistent with an increase in tidal volume, a decrease in alveolar carbon dioxide concentration, an increase in one case in metabolic rate during 30 minutes of oxygen breathing, but not during brief periods, and an unchanged carbon dioxide output. Administration of 5% carbon dioxide produced in normal subjects an extra-ventilation (excess over expected ventilation) which was similar when the gas was combined with either oxygen or with air. The effects of oxygen on respiration are attributed to a reduction in chemo-receptor activity associated with an accumulation of carbon dioxide in the respiratory center.

4950
Shrader, W. A.
AIR SAFETY HIGHLIGHTS. — Aeronaut. Engin. Rev., 14 (2): 24-26, 39. Feb. 1955.
DLC (TL501.A326, v. 14)

The proceedings of the Sixth Annual Air Safety Seminar of the Flight Safety Foundation are reviewed. Discussions conducted on the following problems are briefly reviewed: high speed evacuation, pilot work load, the head-on collision hazard, borderline physical deficiency in pilots, pilot aging, pilot fatigue, identification of bodies, transfer of passengers from ditched aircraft to life rafts, and crash analysis.

4951
Shrinagesh, M. M.
SOME LIMITING FACTORS IN DIVE BOMBING. — Aero Med. Soc. Jour. (New Delhi), 2 (1): 10-18. April 1955.
DNLM

Dive bombing is discussed with reference to technique, centripetal forces developed during pull-out, and human tolerance to centrifugal forces in conventional seated positions. The limitations of dive bombing include: (1) human tolerance to black-out, unconsciousness, and skeletal failure; (2) compression (shock stalls); (3) high speed stalls, and (4) structural limits of aircraft. It is recommended that before beginning dive-bombing training or exercise a pilot be briefed regarding the various limitations involved, know his own threshold and variations to centrifugal forces, and be aware of self-protective maneuvers.

4952
Shurrager, P. S.
POLYMERIZATION OF VITREOUS HUMOR SUBSTRATE IN LIGHT AND DARK ADAPTATION. — Illinois Inst. of Tech. Psychology Lab., Chicago (Contract AF 18(600)-578); issued by Air Research and Development Command, Baltimore, Md. March 15, 1955. iii+[48] p. (Progress Reports 7 and 8, Period July 1-Dec. 31, 1954). AD 71 942
UNCLASSIFIED

Data are presented showing the difference between light- and dark-adapted vitreous humor obtained from glucosamine, ninhydrin, and enzymatic degradation studies. Poise value and the rate of flow were utilized to determine the changing physical properties which accompany chemical changes in dark and light adaptation. The rate of flow (fluidity) and the poise value (reciprocal of viscosity) both increase as one moves from the light- to the dark-adapted state. Both physical properties increase by a factor of approximately 3.7 in 1 hour of dark adaptation. A section is included on psychophysical measurements of human threshold visibility data. Scotopic visibility depends upon light-dark ratio and energy distribution. There is an optimum visibility relationship for every wavelength as a function of light-dark ratio, flash rate, and energy distribution. (From the AD abstract)

4953
Siddall, G. J.,
and D. M. Anderson
FATIGUE DURING PROLONGED PERFORMANCE ON A SIMPLE COMPENSATORY TRACKING TASK. — Quart. Jour. Exper. Psychol. (Cambridge), 7 (4): 159-165. Nov. 1955.
DLC (QP351.E95234, v. 7)

Deterioration in the performance of a single compensatory tracking task requiring the continuous cranking of a wheel to align a target was tested in 21 subjects during a two-hour period. The number and duration of errors was found to increase significantly during each successive half-hour period. Large individual differences in the number and duration of errors were observed.

4954
Siebens, A. A.,
R. E. Smith, and C. F. Storey
EFFECT OF HYPOXIA ON PULMONARY VESSELS IN MAN. — Amer. Jour. Physiol., 180 (2): 428-432. Feb. 1955. DLC (QP1.A5, v. 180)

Pulmonary artery pressures and cardiac outputs of five patients were measured under 'steady-state' conditions at rest, at exercise during euoxia, and at exercise during hypoxia. In each patient exercise at the higher level of oxyhemoglobin saturation was associated with a small rise in pulmonary pressure and a fall in pulmonary vascular resistance. During hypoxia, a level of exercise which produced no further augmentation of oxygen consumption or flow resulted in an additional rise in pressure and, consequently, an increase in resistance. This response was interpreted to indicate constriction of pulmonary vessels. (Authors' summary)

4955
Siegel, A. I.,
and J. Jensen
THE DEVELOPMENT OF A JOB SAMPLE TROUBLE-SHOOTING PERFORMANCE EXAMINATION. — Jour. Applied Psychol., 39 (5): 343-347. Oct. 1955. DLC (BF1.J55, v. 39)

The preparation of a job sample trouble-shooting performance examination is described. The examination consists of four subjects, each of which is directed toward measuring one of the critical abilities judged to be needed in order to adequately trouble shoot on electrical apparatus. The tests were not highly intercorrelated, were judged to be moderately valid, and (except between first and second class) were found to discriminate moderately well between classes of naval aviation electricians. The data suggested certain weak areas in the trouble-shooting (problem-solving) abilities of the men in the various aviation electrician's rates. The development of a short written test, which predicts this performance examination, is also described. (Authors' summary)

4956
Siegel, A. I.,
J. J. Keenan, and E. R. Danzig
A PROCEDURE FOR EVALUATING THE FLEET PROFICIENCY OF GRADUATES OF THE NAVAL AIR TECHNICAL TRAINING "A" SCHOOLS. — Inst. for Human Relations, Philadelphia, Pa. (Contract Nonr-1348(00)); issued by Office of Naval Research, Wash., D. C. 1955. [32] p. AD 213 696 UNCLASSIFIED

Graduates of the Naval Air Technical Center at Jacksonville, Florida were assigned to squadrons in that area for a period of 8 weeks and their performance evaluated by means of two objective evaluative instruments: a Job Diary and a Supervisor's Evaluation Report. Information gathered through these instruments served as a structure for and was supplemented by individual and group interviews. These interviews were conducted separately for the supervisory and graduate personnel in the study group. A high degree of cooperation and motivation was shown by all and there is reason to believe that the data elicited through this methodology are objective and worthy of serious consideration. The research methodology proved economical and practicable in pilot studies conducted by the Aviation Ordnance and Aviation Electrician "A" schools. Consideration and comments are given concerning the limitations and future usefulness of this method. (Authors' abstract)

4957
SILENCING PISTON-ENGINE AIRCRAFT: EXPERIMENTAL HELICOPTER INSTALLATION. — Engineering (London), 179 (4647): 217. Feb. 18, 1955. DLC (TA1.E55, v. 179)

The principle (based on an analogous electrical theory) is described of an exhaust silencer developed for the Westland S.55 Whirlwind helicopter. The general layout of the silencer is illustrated. Reduction in total noise from the helicopter (including rotor and propeller noise) is approximated by 10 decibels.

4958
Silva Fuentes, J. 1954
[NIGHT VISION] Visión nocturna. — Revista de la Fuerza aérea (Santiago de Chile), 14 (53): 15-17. April-June 1954. In Spanish. DLC (UG635.C5A32, v. 14)

The night vision of pilots may be improved by: (1) developing dark adaptation prior to night operations by remaining in a dark area or using red eyeglasses for 30 minutes; (2) protecting this adaptation by not exposing the eyes to bright light until inside the plane; (3) keeping all non-essential lights off, and the essential ones as low as possible; (4) using red lights wherever possible within the plane; (5) reading instruments and maps rapidly; (6) using supplementary oxygen during night flights; (7) eating foods rich in vitamin A; and (8) keeping the windshields clean. (Author's summary, modified)

4959
Silva [Fuentes], J.
[OCULAR ASPECTS OF SUPERSONIC FLIGHT] Aspectos oculares en la aviación supersónica. — Revista de la Fuerza aérea (Santiago de Chile), 15 (56): 29-30. Jan.-March 1955. In Spanish. DLC (UG635.C5A32, v. 15)

The visual problems (modification of visual acuity, visual perception, accommodation and oculmotor reactions) associated with supersonic flight are discussed in relation to the etiological factors. Included factors are: air currents, inclination of the surface optics; vibrations, accelerations; temperature changes; low atmospheric pressure; anoxia; and increased light intensity. It is stressed that protective masks be used by pilots flying at supersonic speeds in order to prevent ocular lesions.

4960
Simons, D. G.
REVIEW OF BIOLOGICAL EFFECTS OF SUBGRAVITY AND WEIGHTLESSNESS. — Jet Propulsion, 25 (5): 209-211. May 1955. DLC (TL780.A613, v. 25)

Disorientation and discoordination resulting from exposure to subgravity and weightlessness depend upon the response of the sensory modalities of equilibrium, vision, and kinesthesis. These modalities are influenced by altered stimulus-sensation

responses, illusions, and sensory inconsistencies. Experimental evidence of disorientation and discoordination due to exposure to subgravity and weightlessness is cited from both animal and human experiments. It is concluded that the vestibular apparatus plays a critical role in the physiological and psychological responses to subgravity exposure. The experimental evidence available to date suggests that incapacitating disorientation may occur in a weightless state in presence of a mental set toward falling, provided tactile and visual references are excluded. (Author's abstract, modified)

4961
SIMULATOR WILL SETTLE APPROACH LIGHT ARGUMENTS. — Aviation Age, 24 (1): 74-77. July 1955. DLC (TL501.A8187, v. 24)

An approach light simulator has been designed by the National Bureau of Standards for use in testing approach-light configurations. Approach lights in a wide variety of configurations and under varying degrees of visibility are simulated by fluorescent miniatures mounted on a wide belt moving continuously towards the pilot, who views the scene through a telescope mounted in a stationary Link trainer. Yaw, bank, and pitch are simulated by the movement of prisms and slides within the telescope. Vertical and transverse motion and position of initial approach are simulated by movement of the belt in the appropriate direction. Servomotors connected to the pilot's controls move the simulator and record a trace of the approach and landing.

4962
Sisson, G. M.,
and M. J. Fregly
A SIMPLIFIED APPARATUS FOR CHRONIC EXPOSURE OF RATS TO LOW OXYGEN TENSION. — Jour. Applied Physiol., 8 (1): 128-131. July 1955. DLC (QP1.J72, v. 8)

An easily and inexpensively constructed apparatus for the continuous exposure of rats to low oxygen tension at atmospheric pressure is described. Equations accurate to 5% for the calculation of the fraction of oxygen in the tank are given. Oxygen consumption of the rats at altitude may also be calculated.

4963
632 MILES PER HOUR SLED RUN. — Military Med., 116 (2): 156. Feb. 1955. DLC (RD1.A7, v. 116)

Lt. Col. John P. Stapp experienced an acceleration to 632 m.p.h. in 5 seconds and a deceleration of 35 g on a rocket-propelled sled with no injury other than small blood blisters and blackened eyes. No protective clothing other than a nylon web harness and plastic helmet was worn.

4964
Slater, A. E. 1952
SENSORY PERCEPTIONS OF THE WEIGHTLESS CONDITION. — In: Probleme aus der astronautischen Grundlagenforschung [International Astronautical Congress, 3rd (Stuttgart, 1952), Proceedings], p. 219-225. Stuttgart, 1952. In English. DLC (TL787.I44, 3rd, 1952)

The human organism is fully able to function adequately in the absence of three basic sensations of gravity: (1) tension in muscles used for balancing, (2) sensation of pressure against any support, and (3) weight and pressure of internal organs. The fourth basic sensation of gravity is mediated by the otolith organs, which provide information of directions, changes in direction, of gravitational pull or any other linear acceleration. Assuming there is a spontaneous basic discharge of impulses to the brain by the maculae in the weightless state in spite of the absence of any pressure of otoliths on the hair cells, the different placement of the maculae in respect to the otoliths in the utricles and the saccules is expected to result in contradictory messages. An alternative hypothesis based on experiences of pilots on blind flights and divers who have dived blindfolded leads to conclude that the real function of the otoliths is not transmission of information but (a) the regulation of muscles for maintenance of equilibrium, and (b) the regulation of eye movements during changes in position of the head to facilitate continuous fixation of objects.

4965
Slater-Hammel, A. T.
ESTIMATION OF MOVEMENT AS A FUNCTION OF THE DISTANCE OF MOVEMENT PERCEPTION AND TARGET DISTANCE. — Perceptual and Motor Skills, 5 (4): 201-204. Dec. 1955. DLC (BF311.P36, v. 5)

The effect of display distance and target distance upon the estimation of movement was studied in a 3x3 factorial experiment with 9 groups of 10 subjects each. Each group observed movement markers sweep across the aperture of a display panel a certain distance and then estimated when the markers would reach certain target distances. There was a significant increase in absolute error with increases in target distance. Conclusions drawn with respect to the percent of absolute error and the direction of constant error indicated a significant difference between the conditions of shortest display distance and those of other display distances. (From the author's summary)

4966
Slattery, B. J.
OXYGEN. — Flying, 56 (3): 30-31; 65. March 1955. DLC (TL501.P6, v. 56)

The following rules are presented for the prevention of anoxia in pilots: (1) oxygen should be in the plane or flight should not be attempted above 10,000 feet; (2) oxygen should be used on every flight above 10,000 feet; (3) oxygen should be used on protracted flights near 10,000 feet; (4) oxygen should be used on night flights above 5,000 feet; (5) flight should not be attempted at altitude with a hangover, or after taking certain medicines (sulfa, aspirin, coal tar derivatives, antihistaminics, or motion sickness pills); and, (6) breathing should be normal when using oxygen, since rapid or extra-deep breathing can cause loss of consciousness as readily as the lack of oxygen.

4967
Sloan, A. W.,
and K. D. Allardyce
THE EFFECT OF EXERCISE AND OF THE CHANGES IN POSTURE ON THE BLOOD PLATELET COUNT IN MAN. — Quarterly Jour. Exper. Physiol. (London), 40 (2): 161-167. April 1955. DNLM

A decrease in the blood platelet count was noted in normal men after 10 minutes of moderate exercise. A partial return to its original level was observed when the subject stood still for the following 20 minutes. The platelet count decreased significantly on standing and remained decreased 10 minutes later. Lying down produced no significant change. Aside from a tendency for the leukocyte count to increase during exercise and to decrease thereafter, the changes in erythrocyte counts were of a minor degree. (Authors' summary, modified)

4968
Sloan, L. L.,
and A. Habel
COLOR SIGNAL SYSTEMS FOR THE RED-GREEN COLOR BLIND: AN EXPERIMENTAL TEST OF THE THREE-COLOR SIGNAL SYSTEM PROPOSED BY JUDD. — Johns Hopkins Univ. Wilmer Inst., Baltimore, Md.: issued by School of Aviation Medicine, Randolph Field, Tex. Report no. 55-20, Feb. 1955. 8 p. AD 69 412 PB 117164

An experimental investigation is made of Judd's proposed three-color code for instrument panel lights. The adequacy of these specifications is tested using both normal and color deficient subjects. It is shown that if certain specific limiting conditions are met as to the luminance, subtense, and chromaticity of the light signals, all normal observers and a majority of color deficient observers can make the necessary identifications. The possible explanations for the poor performance of some but not all protanopes are discussed. (Authors' abstract)

4969
Slote, L.,
M. Koenig, and R. Drillis
AEROMEDICAL EVACUATION LITTER PATIENT SAFETY DEVICE STUDY. — New York Univ. Coll. of Engineering, N. Y. (Contract AF 33(600)-28333); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-333, Nov. 1955. vi+68 p. AD 104 851 UNCLASSIFIED

A study is presented to recommend specifications for a mechanical restraining device which will provide the necessary restraint for the safety of injured personnel and psychotic litter patients during air evacuation. To accomplish this purpose, the medical and operational requirements for an adequate litter patient safety harness are determined, and tentative design specifications are evaluated in a series of tests. For purposes of this evaluation, a prototype model incorporating the design specifications was constructed and compared to existing devices with respect to the various important medical and operational requirements necessary for air evacuation of litter patients. From the evaluation, final design specifications for a proposed aeromedical evacuation litter patient safety harness were developed. (From the authors' abstract)

4970
Smith, Arden K.,
S. Wing, and H. J. Jerison
EFFECT OF ACOUSTIC NOISE ON TIME JUDGMENT [Abstract]. — Amer. Psychologist, 10 (8): 428-429. Aug. 1955. DLC (BF1.A55, v. 10)

Fourteen subjects were required to press a key at what they judged to be ten-minute intervals, while performing a different task involving keeping track of a series of ongoing events. There were three two-hour sessions with each subject, a training session in relative quiet, and two subsequent sessions, one of which was an experimental session, partly in quiet and partly in noise, and the other was a control session with quiet throughout. Mean time judgments were 7 min. in noise, and 9 min. in quiet. It is concluded that time judgments are distorted in a high-energy noise field. The results are interpreted in terms of a hypothesis which relates the temporal dimension of behavior to the central neural mechanisms of audition.

4971
Smith, Charles W.,
and J. W. Bean
ADRENAL FACTORS IN TOXIC ACTION OF O_2 AT ATMOSPHERIC PRESSURE. — Federation Proceedings, 14 (1[1]): 140. March 1955. DLC (QH301.F37, v. 14)

Adrenalectomy was observed to prolong survival time in rats and diminish lung damage induced by the inhalation of oxygen at atmospheric pressure. Administration of cortisone or epinephrine enhanced lung damage and shortened survival time. It is concluded that the protective action of hypophysectomy against oxygen poisoning is due largely to an elimination of adreno-cortical factors, and that adrenalectomy protects by eliminating both medullary and cortical factors.

4972
Smith, Charles W.
ENDOCRINE FACTORS RELATED TO TOXICITY OF OXYGEN AT ATMOSPHERIC PRESSURE. — Microfilm AC-1, no. 12,648. Ann Arbor: University Microfilms, 1955. viii+97 p.

Hypophysectomy or adrenalectomy was observed to decrease pulmonary pathology and hydrothorax and to increase survival time in rats exposed to an atmosphere of 95% oxygen. Administration of cortisone, epinephrine, or thyroid hormone shortened survival time and increased pulmonary pathologic effects. It is concluded that the endocrine factors known to be damaging in high pressure oxygen breathing are also operative in oxygen breathing at atmospheric pressure.

4973
Smith, Elizabeth
A NEW APPARATUS FOR LONG TERM MEASUREMENT OF OXYGEN CONSUMPTION IN SMALL MAMMALS. — Proc. Soc. Exper. Biol. and Med., 89 (4): 499-501. Aug.-Sept. 1955. DLC (QP1.S8, v. 89)

A new closed-circuit apparatus is described which continuously records oxygen consumption over periods of several days with automatic correction for changes in barometric pressure. The equipment is sensitive to less than 0.01 ml. of oxygen per hour and can measure oxygen consumption over a wide range. (Author's summary)

4974
Smith, Ernest W.,
and C. L. Conley
SICKLEMIA AND INFARCTION OF THE SPLEEN

DURING AERIAL FLIGHT. — Bull. Johns Hopkins Hospital, 96 (1): 35-41. Jan. 1955. DNLM

Twelve instances of sickle cell trait and 3 of sickle cell-hemoglobin C disease were revealed by electrophoresis in 15 cases of splenic infarction occurring during aerial flight. The diagnosis of the rare sickle cell hemoglobin disease in two cases of infarct at a relatively low altitude of 4,000-6,000 feet indicates the particular susceptibility of this group to the effects of altitude.

4975
Smith, F. E.
INDICES OF HEAT STRESS: A STATISTICAL COMPARISON OF EFFECTIVE TEMPERATURE AND AN INDEX BASED ON SWEAT LOSS. — Medical Research Council (Gt. Brit.), Memorandum no. 29, 1955. 52 p. DNLM

The relative predictive accuracy of indices of physiological heat stress based on sweat loss or on effective temperature (temperature, humidity, and air speed) was determined by a statistical examination of the experimental data of McArdle et. al. (1947) on the basis of which the sweat rate index was advanced. The accuracy of prediction by the two scales of amount of sweat loss and rectal temperature was determined in subjects exposed to environmental conditions of varying heat, humidity, and air speed while wearing overalls and shorts or shorts only, and while working at 54 or 111 kcal./m.^{2}/hr. It is concluded that: (1) Sweat rate in a hot environment can be predicted from effective temperature when the rate of work is known; the prediction is less accurate than that made by the four-hour sweat rate scale; the possible error in prediction of individual sweat rates is large in both cases. (2) Certain limitations of the scales may be eliminated by suitable adjustment; more information is required before the effective temperature scale can be so adjusted. (3) The rate at which a man works may be included in the effective temperature index by the addition of a simple nomogram or by the use of a series of graphs. (Quoted in part)

4976
Smith, Francis A.
DITCHING SEAT FOR AIRCRAFT OCCUPANTS. — Lockheed Aircraft Corp., Burbank, Calif. U. S. Patent 2,678,180. May 11, 1954. 3 leaves. DP

A reliable, inexpensive, and light-weight ditching seat designed for the protection of aircraft occupants in emergency landings on water is described. The seat normally occupies a minimum of space (recessed or secured flat on the floor) and is capable of easy, rapid installation and removal.

4977
Smith, H. P. Ruffell
BRITISH THEORY AND PRACTICE IN THE LAYOUT OF AIRCRAFT COCKPITS. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 52-61. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

The work of the Royal Air Force in the development of aircraft cockpits favorable to high crew performance is discussed. Basic dimensional improvements in cockpit design have been accomplished by adjustment of the variable dimensions of mock cockpits to established anthropological and physiological standards.

4978
Smith, H. P. Ruffell
OPENING DISCUSSION ON HUMAN ENGINEERING. — In: North Atlantic Treaty Organization, Anthropometry and human engineering, p. 73-74. London, Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 5)

A brief discussion is presented of three papers [abstracted as items no. 4275, 4372, and 5010 in this volume] concerning various aspects of human engineering and cockpit design. The usefulness of instrument combinations and "fly to" relationships, and the dangers of excessive and premature standardization and reliance on visual cue instrumentation are considered.

4979
Smith, John T.
OPHTHALMOLOGY IN AVIATION MEDICINE. — In: Bureau of Medicine and Surgery, Aviation Medicine Practice, p. 49-80. Bureau of Naval Personnel, Washington, D. C. NAVPERS 10839-A, 1955. DLC (RC1062.U52)

The technique and physical standards for tests used during the portion of the flight physical examination related to the eyes is discussed. Included are tests of visual acuity; accommodation; phorias; associated parallel movement; visual fields; depth perception; color vision; night vision and the red lens test. Ophthalmological problems associated with blackout, anoxia, and night vision are noted along with the problem of selecting protective ocular goggles and sunglasses.

4980
Smith, P.
STUDIES IN THE CHEMISTRY OF STRESS. I. THE EXCRETION OF ETHER SOLUBLE METABOLITES IN ANOXIA. — RAF Inst. of Aviation Medicine (Gt. Brit.), Farnborough; issued by Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 931(a), Nov. 1955. 5 p. AD 81 809 UNCLASSIFIED

Two series of chromatograms of extracts from acid-hydrolyzed urine samples of subjects exposed to normal working-day and mild anoxia conditions were compared to determine whether anoxia caused the appearance in urine of any abnormal metabolites. The samples were obtained from 5 apparently healthy young male subjects who were placed in a decompression chamber at an altitude equivalent to 14,000 feet without oxygen for 2-hour periods. Urine was collected just before descent; urine from the control subjects was collected at about the same time during similar periods of normal activity. Chromatograms of not more than 2 of the 5 subjects' samples showed occasional abnormal spots. No over-all increase or decrease in anoxia was noted in the numbers and intensities of the total spots which were detected. (From the AD abstract)

4981
Smith, P.
STUDIES IN THE CHEMISTRY OF STRESS. II. A NEW METHOD OF URINE ANALYSIS: ITS APPLICATION TO THE STUDY OF ANOXIA. — R.A.F.

Inst. of Aviation Medicine, Farnborough; issued by Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 931 (b), Dec. 1955. 4 p. AD 84 373 UNCLASSIFIED

Material obtained by precipitation with ferric chloride from the urine of normal and anoxic subjects was chromatographed in ethanol-water-concentrated ammonia and butanol-acetic-acid water. An increase in number of spots was observed in chromatograms from anoxic subjects. The uncertainty of chemical transfer mechanisms in the preparation of the chromatographed material makes the method unsatisfactory for the quantitative analysis of urine.

4982
Smith, P.
STUDIES IN THE CHEMISTRY OF STRESS. III. EXCRETION IN NORMAL AND ANOXIC SUBJECTS OF SUBSTANCES ADSORBED BY CHARCOAL. — R. A. F. Institute of Aviation Medicine, Farnborough; issued by Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 931 (c), Dec. 1955. 3 p. AD 84 372 UNCLASSIFIED

Charcoal-adsorbed material from the urine of normal and anoxic subjects was chromatographed in ethanol-ammonia and butanol-acetic acid. An increase in the number of spots and a distribution shift from weak to stronger spots were observed in chromatograms from anoxic subjects. It is concluded that anoxia causes a general increase in the excretion of substances which can be detected by the charcoal adsorption method.

4983
Smith, Robert G., and D. B. Gragg
QUALITY CONTROL PROCEDURES FOR MONITORING PSYCHOLOGICAL TESTING. — Air Force Personnel and Training Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-21, Aug. 1955. [18] p. AD 78 567 UNCLASSIFIED

Procedures developed for rapid identification of unstandardized testing conditions are described. These methods are applicable to any large-scale testing program.

4984
Smith, William M.
EFFECT OF MONOCULAR AND BINOCULAR VISION, BRIGHTNESS, AND APPARENT SIZE ON THE SENSITIVITY TO APPARENT MOVEMENT IN DEPTH. — Jour. Exper. Psychol., 49 (5): 357-362. May 1955. DLC (BF1.J6, v. 49)

Both brightness and mode of vision affect sensitivity to apparent movement in depth (change in the angular size of a projected image in a homogeneous field). Greater sensitivity was associated with the higher brightness value and binocular vision. The brightness factor seemed to affect sensitivity more than did mode of vision. The apparent size of the stimulus was not related to the subject's sensitivity to movement. Interactions of subjects with both factors of brightness and viewing condition were found in the data. The findings of the experiment were related to other visual sensitivity data and to experiments dealing with the effects of so-called "behavioral" factors on perceptual sensitivity. (Author's summary, modified)

4985
Snepvangers, G. J.
[TRANSPORT OF THE SICK AND WOUNDED BY AIR] Vervoer van zieken en gewonden door de lucht. — Nederlands militair geneeskundig tijdschrift (Gravenhage), 8 (3): 75-84. 1955. In Dutch. DLC (RC971.N4, v. 8)

The historical development of the use of airplanes for the transportation of the sick and wounded from the front lines is reviewed. General principles of medical care need for different categories of patients in flight are enumerated. The air transport of wounded results in considerable advantages to the patient, as well as savings of personnel and materials. Also, the experience shows that flight is not absolutely contraindicated for anybody, provided a specially equipped aircraft is used and the medical personnel aboard is well trained in the basic principles of aviation medicine. Practical guidelines are offered for the placement of airstrips at the front and the planning of evacuation hospitals.

4986
Snyder, R., J. R. P. French, and A. J. Hoehn
EXPERIMENTS ON LEADERSHIP IN SMALL GROUPS. — Michigan Univ., Ann Arbor (Contract AF 33(038)-14091); issued by Air Force Personnel and Training Research Center. Training Aids Research Lab., Chanute Air Force Base, Ill. Research Report no. AFPTRC-TN-55-1, Jan. 1955. vi+45 p. (Project no. 507-009-0002). AD 72 656 PB 120307

Two experiments were performed: (1) a group judgment experiment concerned with the influence of the leader (a noncommissioned officer) on perceptual discrimination judgments of group members, and (2) a card-sorting experiment concerned with leader influence on productivity of the members. The following hypotheses were tested: (1) attempts by the group leader or member to exert influence increase with his acceptance by others in the group; (2) the influence which is attempted increases with the certainty with which a leader or member holds his opinion; (3) attempts by others in the group to influence group member or leader decrease with his certainty in his opinion; (4) the effectiveness of the leader or member to influence another member of the group increases with the member's acceptance of him; (5) the leader's effectiveness in influencing the follower increases with the follower's acceptance of the authority conferred by the leader's role; (6) the leader's effectiveness increases with the perceived expertness of the leader in the area of the influence he attempts; (7) the leader's influence increases with the number of influence attempts he directs to a member. Results supported the first hypothesis as it applied to among-groups differences in attempted influence, but did not establish within-groups relationships. Results supported the second, fourth, and sixth hypotheses, but failed to support the others. (AD abstract)

4987
Soar, R. S.
HEIGHT-WIDTH PROPORTION AND STROKE WIDTH IN NUMERAL VISIBILITY. — Jour. Ap-

plied Psychol., 39 (1): 43-46. Feb. 1955.
DLC (BF1.J55, v. 39)

The aim of the study was to test the effect of different combinations of height and width, with area held constant, on the visibility of numerals. Since stroke width might be expected to interact with height and width, it was studied simultaneously. A total of 72 subjects provided six replications for all combinations of height-width proportion at four levels, and stroke width at three levels. The data were treated by analysis of variance and covariance. Height-width proportion was a source of variation in visibility significant beyond the 1% level for five numerals, and beyond the 5% level for a sixth. Stroke width was a significant source of variation for only one numeral. The most visible combination of height, width, and stroke width for all numbers is a height-width ratio of 10:7.5 and a stroke width to height ratio of 1:10. Height-width proportion and stroke width show no interaction. (Author's summary)

4988
Soar, R. S.
STROKE WIDTH, ILLUMINATION LEVEL, AND FIGURE-GROUND CONTRAST IN NUMERAL VISIBILITY. — Jour. Applied Psychol., 39 (6): 429-432. Dec. 1955. DLC (BF1.J55, v. 39)

Three variables in numeral visibility, stroke width, illumination level, and whether the number is white on black or black on white were studied. Forty subjects observed, providing five replications of experimental conditions. The results were treated by analysis of variance, with the interactions the items of most interest. The results were these: (1) neither stroke width nor mode of figure-ground contrast showed a significant influence on visibility, but the illumination level was highly significant; (2) the stroke width interacted significantly with the illumination level; (3) the stroke width interacted significantly with the mode of figure-ground contrast; (4) the interaction between illumination level and whether the number was black on white or white on black was not significant; further, there was no suggestion in the data that such an interaction exists; and (5) the interaction of all three variables was significant. (Author's summary)

4989
Sokoloff, L.,
R. Mangold, R. L. Wechsler, C. Kennedy, and S. S. Kety
THE EFFECT OF MENTAL ARITHMETIC ON CEREBRAL CIRCULATION AND METABOLISM. — Jour. Clinical Investigation, 34 (7, Part 1): 1101-1108. July 1955. DLC (R11.J67, v. 34)

Despite a shift in the electroencephalographic pattern to lower voltage, higher frequency, asynchronous activities and small but statistically significant rises in pulse rate and mean arterial blood pressure, no changes in cerebral blood flow, cerebral oxygen consumption, cerebral vascular resistance, and cerebral respiratory quotient from the control levels were observed during the performance of mental arithmetic. (From the authors' summary)

4990
Sollberger, A.
[DIURNAL FLUCTUATIONS IN THE VARIANCE OF BIOLOGICAL VALUES] Tagesschwankungen in der Streuung biologischer Werte. — Acta medica scandinavica (Stockholm), Suppl. 307: 69-75. 1955. In German. DNLM

The significance of diurnal fluctuations in the variance or the frequency distribution of biological values is discussed, citing examples of research in diurnal variations of liver glycogen, leukocytes, and eosinophils.

4991
Soussen
[PSYCHOSOMATIC MEDICINE AND AVIATION MEDICINE] Médecine psycho-somatique et médecine de base aérienne. — Forces aériennes françaises (Paris), no. 105: 1081-1094. June 1955. In French.
DLC (UG635.F8F66, v. 1955)

It is shown that the psychological approach to physical illness may be successfully applied to military medicine. Ailments such as headaches, cardiac troubles, and asthma, for which no physiological cause is discovered, may often be related by interview or by associative tests (particularly the Rorschach test) to known sources of worry or subconscious psychological disturbances. The aggressive character of pilots and the nature of their work makes the application of this method of diagnosis to aviation medicine particularly useful. Here periodic physical and psychological examinations are necessary to deal with the chronic fatigue and nervousness commonly found in pilots, and to prevent accidents of pilot error. It is suggested that greater emphasis be placed on the psychological training of doctors.

4992
Spealman, C. R.,
and P. T. Bruyere
THE CHANGING AGE DISTRIBUTION OF PILOTS HOLDING FIRST CLASS MEDICAL CERTIFICATES. — Jour. Gerontol., 10 (3): 341-344. July 1955.
DNLM

The number of holders of Class I medical certificates in the upper age groups (40 years and older) has increased considerably and progressively from 1946 through 1952, while changes in the opposite direction have occurred in the lower age groups (below 30 years). The increase in numbers of older certificate holders is presumably due to the fact that the middle and upper age groups of holders are made up largely of pilots who retain their Class I medical certificates. The strong tendency to retain this certificate and also to continue active flying was demonstrated by examining the individual medical records of pilots in upper age groups. Of the pilots who were 50 years old or older in 1949, 70% still retained their Class I medical certificates in 1953 when they were 54 to 64 years old. The number of older certificate holders is only slightly greater than the number of pilots with currently valid airline transport ratings. Based on data on age distributions of pilots in 1946, 1949, and 1955, it can be estimated that there will be about 1,000 Class I medical certificate holders 50 years of age or older in 1957, and over 2,000 in 1962. (From the authors' summary)

4993
Spealman, C. R.
LANDING GEAR ACCIDENTS IN AIRLINE OPERATIONS: A SIX-YEAR SUMMARY. — Jour. Aviation Med., 26 (5): 417-422. Oct. 1955.
DLC (RC1050.A36, v. 26)

During the period between 1948-1953, there were 85 landing gear accidents in civil aviation (excluding Alaska). Pilot error was admitted or strongly suspected in 30 of the accidents. Analysis indicated that stressful situations predispose to landing gear errors, especially failure to extend the gear for landing. The particular conditions associated with some phases of flight lead to the occurrence of errors. Probably there is no great difference between captains and copilots in susceptibility to making these errors, nor does seating (left or right) effect the occurrence of errors. (Author's summary, modified)

4994
Spector, W. S. (ed.)
HANDBOOK OF TOXICOLOGY. — Vol. 1. National Research Council. Division of Biology and Agriculture, Washington, D. C. (Contract AF 33(616)-2973); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 55-16, April 1955. vii+408 p. (Project no. 7159-71802). AD 75 869 UNCLASSIFIED

This report presents tabular data on the acute toxicity of 2000 substances for several species of commonly used laboratory animals. The values have been culled from the literature over a period of years, and wherever possible have been rechecked with original publications and reviewed by 28 experts in the field. In addition to indicating a single value on the toxicity of each substance for a given animal, the table presents information concerning the lethal dosage range, vehicle, route of administration, and time of death, whenever such information was available in the references. Supplementing quantitative data are: (1) an easily comprehensible and directly useable cross index of chemical compounds, including synonyms; (2) a complete list of abbreviations with full titles of references cited in the volume, and (3) a compilation of symbols, with definitions. (Author's abstract, modified)

4995
"SPECTRUM" CHART OF HUMAN BODY ACCELERATION. — U. S. Air Force Medical Service Digest, 6 (11): 27. Nov. 1955.

A chart is presented exhibiting several typical examples of stresses (catapult, parachute opening shock, etc.) which act on the human body in connection with linear accelerations and decelerations and the respective tolerance limits. It covers a range of accelerations from those of low order, which are entirely harmless for indefinite periods, to lethal impacts operating for only a few milliseconds. Acceleration and its associated force is expressed in g units. For acceleration, these are multiples of the acceleration due to gravity. For force, they are multiples of the normal weight of a given object. The log-log grid is based on the normal relationship of acceleration, initial or final velocity (the obverse being zero), time and distance in uniform acceleration expressed by given equations. The coordinate systems permit determination for any given point on the chart or the interrelated physical factors involved in the particular accelerational or decelerational event. (Quoted in part)

4996
Sperry, E. G.,
H. P. Nielsen, and I. M. Barash
DOWNWARD EJECTIONS AT HIGH SPEEDS AND HIGH ALTITUDES. — Washington, D. C. Office of the Secretary of Defence, Research and Development, Supplement to Shock and Vibration Bulletin, no. 22, p. 28-39. July 1955. DNLM
Essentially the same in: Jour. Aviation Med., 26 (5): 356-372. Oct. 1955.
DLC (RC1050.A36, v. 26)

The total series of in-flight, human-subject downward ejection tests conducted by the Air Force at altitudes from 10,000 to 45,000 feet and at speeds from 200 to 423 knots is described. It is concluded from results of the tests that (1) no harmful effects are caused by loss of helmets and masks; (2) stiff neck appears to be the common result of seat ejection; (3) wind blast during ejection at 423 knots has no harmful effects on the face; (4) exposure of the eyes during free fall from 45,000 feet does not cause pain or loss of vision; (5) severe spins may be encountered during free falls from high altitudes, resulting in some cases in physiological harm; (6) an improved D-ring shock-absorbing mechanism permits grip retention at speeds to a minimum of 423 knots; (7) leg retainers prevent leg injury due to wind blast, but require improvement; (8) seat separation is unreliable; and (9) forces imposed during ejection by the catapult, seat rotation, and deceleration have negligible physiological effect.

4997
Spieth, W.,
and J. C. Webster
LISTENING TO DIFFERENTIALLY FILTERED COMPETING VOICE MESSAGES — Jour. Acoust. Soc. Amer., 27 (5): 866-871. Sept. 1955.
DLC (QC221. A4, v. 27)

An attempt was made to improve listeners' ability to respond to one of two or more simultaneous or overlapping voice messages by differentially filtering the competing message channels. The limits of satisfactory intelligibility of digits and two International Civil Aeronautics Organization phonetic alphabet words in a message also containing an address were determined under various conditions of high- and low-pass filtering and speech-to-noise ratios (S/N). Performance was consistently improved by differential filtering of messages, regardless of whether the desired message or competing messages were filtered. High-pass cutoffs of 565, 800, or 1130 c.p.s. were about equally effective and were considerably better than high-pass cutoffs at or below 280 c.p.s. Low-pass cutoffs of 1600, 1130, and 800 c.p.s. also improved performance substantially. (Authors' abstract, modified)

4998
Spragg, S. D. S., 1953/1955
and J. W. Wulfeck
VISUAL PERFORMANCE AS A FUNCTION OF THE BRIGHTNESS OF AN IMMEDIATELY PRECEDING VISUAL TASK. — Univ. of Rochester, Dept. of Psychology, N. Y. (Contract W33(038)-ac-18317); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Report no. 52-285, Dec. 1953. v+16 p. (RDO no. 694-41). AD 27 599
PB 113699
Also published as: THE EFFECT OF IMMEDIATELY PRECEDING TASK BRIGHTNESS ON VISUAL PERFORMANCE. — Jour. Applied Psychol., 39 (4): 237-243. Aug. 1955. DLC (BF1.J55, v. 39)

The effect of brightness of a preceding task on visual performance on the next task at low photopic brightness levels was investigated. In the near task, subjects read banks of reproductions of instrument dials at 28 in. viewing distance under three task brightnesses of 2.9, 0.083, and 0.005 foot-lamberts. In the far task, the subjects read periscopically banks of Landolt rings at 18 ft. visual distance under 5 task brightnesses: 6.0, 0.076, 0.01, 0.007, and 0.0035 foot-lamberts. In the first experiment, the subjects were visually adapted to the brightness level of the near task, performed the near task, then performed the far task. Experiment II was similar, except that the subjects first performed the far task and then the near task. Within the brightness ranges used, performance on a visual task was related to the brightness of that task but bore no general relation to the brightness of the immediately preceding visual task. The critical 0.02 foot-lambert level of dial brightness previously found for this task can safely be exceeded by one, and possibly two log units of brightness without impairing performance of a second, low photopic brightness task. These findings refer to task brightnesses at and above cone threshold and to detailed visual tasks requiring foveal vision. (Authors' summary, modified)

4999
Stapp, J. P.
EFFECTS OF MECHANICAL FORCE ON LIVING TISSUES. I. ABRUPT DECELERATION AND WINDBLAST. — Jour. Aviation Med., 26 (4): 268-288. Aug. 1955. DLC (RC1050.A36, v. 26)

Experiments were performed dealing with the effects of rapid deceleration and windblast upon the human body. A special sled was developed which operated upon a rail; it was propelled by solid-fuel rockets, and braked by means of water scoops beneath the sled. Linear deceleration of 13 g front to back for a duration of 0.6 seconds, or 9 g front to back for 2.7 seconds, produced effects comparable to those on the centrifuge. Limits for human tolerance were determined to be as follows: (a) Threshold for impact shock related to rate of change of deceleration — 1,000 g per second at 30 g for 0.16 second or less of duration. (b) Limit of tolerance for rate of change of deceleration -- 1,500 g per second at 40 g for 1.6 second duration or less. (c) Tolerance limit for magnitude of force — 50 g attained at 500 g per second rate of onset and duration of 0.2 second or less. (d) Duration limit — 1 second for forces averaging 25 g or more, at 500 g per second rate of onset. Wearing a windproof helmet and with head and extremities adequately restrained against flailing, the human subject was adequately protected against a windblast force of 7.7 pounds per square inch.

5000
Stapp, J. P.
TOLERANCE TO ABRUPT DECELERATION. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 122-169. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

On the basis of experimental exposures of human, chimpanzee, and hog subjects to abrupt decelerative forces by means of linear decelerations, it has been conservatively estimated that tolerance limits for human subjects approximate 50 g peaks (100 g for survival) at 500 g per second rate of onset for 0.25 second duration, with adequate restraints impinging on solid structures of the shoulders and pelvis or against the back surface of the body. Adequately restrained chimpanzees and hogs sustained peaks of 80 g or more with minimal reversible injuries in all body orientations, and survived peaks of more than 200 g in the forward facing seated position. The rate of change of deceleration, the body area impinged upon, and the configuration of restraints are the limiting factors to tolerance and survival of exposure to linear decelerative forces. (Author's summary, modified)

5001
STAPP PLANS SUPERSONIC SLED TEST. — Aviation Week, 62 (1): 15. Jan. 3, 1955. DLC (TL501.A8, v. 62)

Experiences on a sled test simulating conditions of supersonic bailout are described. Deceleration forces of -35 g and wind pressures of 7.7 p.s.i. were achieved. A visual blackout of 2 sec. due to rapid acceleration was followed by redout at deceleration and extreme pain in the eyes which persisted for 8 1/2 min. after the run.

5002
Steele, J. E.
MOTION SICKNESS. — Office of the Secretary of Defence, Research and Development, Washington, D. C., Supplement to Shock and Vibration Bulletin, no. 22: 1-5; discussion, p. 5-6. July 1955. DNLM

The symptoms, causes, and methods of prevention of motion sickness are discussed. The role of the frequency, amplitude, and direction of linear and angular accelerations in the production of motion sickness through visual and vestibular disorientation is discussed. It is concluded that motion sickness results from the excessive effort required to integrate data received in the various parts of the central nervous system in the determination of an adequate spatial orientation.

5003
Stefanović, M. 1954
[ON THE CHEMICAL COMPOSITION OF THE BLOOD IN LETHARGIC HYPOTHERMIA] Sur la composition chimique du sang dans l'hypothermie léthargique. — Bulletin de la Société de chimie biologique (Paris), 36 (8): 1151-1161. 1954. In French. DNLM

Deep hypothermia was induced in rats either by cold baths or by exposure to cold environmental temperature. A rectal temperature of approximately 15° C. was maintained by the animals. Blood composition in both groups of animals exhibited the following: (1) no significant change in water and sodium content; (2) significant increase in chloride content; (3) hyperphosphatemia; (4) hyperglycemia; (5) slight decrease in plasma proteins; (6) notable increase in non-protein azotemia; (7) uremia increased with the degree of hypothermia; (8) no change in lactic acid or hemoglobin content; and (9) a significant decrease in leukocyte and lymphocyte numbers, with no change in erythrocytes. A slight increase was noted in blood potassium content in the cold bath-treated animals, whereas those exposed to cold air demonstrated marked hyperkaliemia.

5004
Steggerda, F. R.,
W. C. Clark, and I. E. Danhof
MOTILITY AND TONE OF THE HUMAN COLON AT VARIOUS SIMULATED ALTITUDES. — Jour. Aviation Med., 26 (3): 189-193, 199. June 1955.
DLC (RC1050.A36, v. 26)

Motility patterns of the colon at simulated altitudes were studied in eight male subjects. 300 cc. of air were slowly introduced into the lower colon after that segment of the digestive tract had been evacuated. Colonic tone and activity were recorded at altitudes up to 25,000 feet. The tone of the colonic musculature showed only minor changes during the decompression procedures. The activity of the colon increased with a decrease in ambient pressure; oxygen inhalation resulted in further activity increases; ingestion of a pint of milk 20 minutes after decompression had begun, caused an immediate increase in colonic activity due possibly to the gastrocolic and gastroileal reflexes.

5005
Steier, H. P.
AIRFRAME, INSTRUMENTATION DESIGNS YEARS APART. — Amer. Aviation, 18 (23): 26-28. April 1, 1955. DLC (TL501.A675, v. 18)

The inadequacies of existing aircraft instrumentation systems were discussed in a symposium conducted at Moody Air Force Base, Georgia. Deficiencies reported include non-standardization of panel instruments, lack of cooperation between designer and operator, insufficiently accurate altimeter systems, heading indicators, vertical speed indicators, and machmeters, and inadequate navigation systems.

5006
Steier, H. P.
NON-LINEAR POTENTIOMETERS PRODUCE NEW STANDARDS OF FIDELITY IN FLIGHT SIMULATORS. — Aero Digest, 70 (2): 68, 70, 72. Feb. 1955. DLC (TL501.A292, v. 70)

New standards of fidelity in flight simulators are presented which utilize huge resolution nonlinear potentiometers in conjunction with conventional servo units. Used with digital computers, servos transmit to appropriate circuits the effects of engine and weather conditions on aircraft flight. Simulators are of value in training for judging the psychological and technical aptitude of the trainees. Mention is made of simulators capable of teaching not only instrument flight but also techniques of transitional training, and of simulators to train crews for specific commercial aircraft.

5007
Stevens, C. E.,
S. A. D'Angelo, K. E. Paschkis, A. Cantarow, and F. W. Sunderman
THE RESPONSE OF THE PITUITARY-THYROID SYSTEM OF THE GUINEA PIG TO LOW ENVIRONMENTAL TEMPERATURE. — Endocrinol., 56 (2): 143-156. Feb. 1955.
DLC (QP187.A25, v. 56)

The pituitary-thyroid system in the guinea pig was studied during exposure to an environmental temperature of about 7° C. Histological activation of the thyroid and increased blood titres of thyrotrophic hormone (TSH) were observed after one week in the cold. Longer exposures (6-11 weeks) induced a significant elevation in TSH concentration in the anterior pituitary and a pronounced increase in the number of hypertrophied basophil cells containing increased amounts of glycoprotein granules. Serum protein-bound iodine, thyroid-body weight ratios, and 24-hour I^{131} uptake by the thyroid were not appreciably altered by exposure to low temperature. The rate of release of radioiodine from the thyroid was approximately doubled, however, and significant increases in oxygen consumption were found throughout the entire exposure period. The elevation in basal metabolic rate by cold could be largely abolished by thyroidectomy. Analysis of the experimental data indicates that heat production in the cold-exposed guinea pig is maintained primarily by an activation of the pituitary-thyroid system in which secretion of thyrotrophic hormone and thyroid hormone is augmented. (Authors' summary, modified)

5008
Stevens, S. S.,
M. S. Rogers, and R. J. Herrnstein
THE APPARENT REDUCTION OF LOUDNESS: A REPEAT EXPERIMENT. — Jour. Acoust. Soc. Amer., 27 (2): 326-328. March 1955.
DLC (QC221.A4, v. 27)

The experiment of Laird, Taylor, and Wille (1932) showed that the reduction in the intensity of a sound required to produce half-loudness is of the order of 20 db. Since this result is out of line with most other studies in this field, an attempt was made to repeat the experiment with a similar piece of apparatus (2-A audiometer). The first attempt to copy the procedure of Laird, Taylor, and Wille gave results more like those usually obtained, namely, a required reduction for half-loudness of the order of 10 db. A second experiment, involving the use of comparison tones placed as much as 40 db. below the standard, gave results more like those of Laird, Taylor and Wille. The method they used appears to be overly sensitive to the range and order of presentation of the comparison stimuli. (Authors' abstract)

5009
Stevens, S. S.
THE MEASUREMENT OF LOUDNESS. — Jour. Acoust. Soc. Amer., 27 (5): 815-829. Sept. 1955.
DLC (QC221.A4, v. 27)

A review is presented of available evidence (published and unpublished) concerning the relation between loudness and stimulus intensity. The evidence suggests that for the typical listener the loudness L of a 1000-cycle tone can be approximated by a power function of intensity I, of which the exponent is $\log_{10}2$. The equation is $L = kI^{0.3}$. Intensity is assumed to be proportional to the square of the sound pressure. In terms of sones, where 1 sone is the loudness produced by a tone at 40 db. above the standard reference level, the equation for loudness L as a function of the number of decibels N becomes: $\log L = 0.3N - 1.2$. Thus a loudness ratio of 2:1 is produced by a pair of stimuli that differ by 10 db.; this relation appears to hold over the entire range of audible intensities. At low levels of intensity, the loudness of white noise grows more rapidly than the loudness of a 1000-cycle tone, but above the level of approximately 50 db. the loudness of continuous noises may be calculated from the equation: $\log L = 0.03N$ S, where S is a spectrum parameter to be determined empirically. (Author's abstract, modified)

5010
Stewart, W. K.
ADAPTING THE AEROPLANE TO THE PILOT. — In: North Atlantic Treaty Organization, Advisory

Group for Aeronautical and Research and Development, Anthropometry and human engineering, p. 41-46. London, Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 5)

The procedure followed by the Royal Air Force for the design of cockpits in new aircraft favorable to high pilot performance includes: (1) investigation of the operational requirements of the aircraft, (2) consultation with technical representatives of the designing firm to ensure compliance with operational requirements, (3) participation in the construction of mock cockpits and in acceptance conferences, (4) scanning of the initial test flying program, (5) participation by medical officers in acceptance trials, and (6) participation by medical officers in the early operational use of the aircraft. Standards of pressurization, temperature, escape, and cockpit dimensions and layout have been established to assist in the supervision of aircraft design.

5011
Stewart, W. K.,
H. P. Ruffell Smith, D. Williams, and V. H. Tomkins
DISCUSSION ON THE ROLE OF THE NERVOUS SYSTEM IN ADAPTATION TO HIGH PERFORMANCE FLYING. — Proc. Roy. Soc. Med. (London), 48: 868-878. July-Dec. 1955. DLC (R35.R7, v. 48)

The neurophysiological basis for stress reactions is explored in a discussion of the problems of crew performance in modern aircraft. Certain physiological phenomena, including changes in potassium excretion, excretion of 17-ketosteroids, adrenaline secretion, and vaso-vagal collapse with hyperventilation syndrome, are shown to be associated with the psychological stresses of fear, anxiety, concentration, alteration of the normal rhythm of living, and startling. These stress reactions may induce black-out, disorientation, or neurosis. Other problems affecting the integrative capacity of the central nervous system include those of presentation of data, control feel and response, and the effects of extraneous influences (noise, vestibular stimulation).

5012
Stewart, W. K.,
K. E. Spells, and J. A. Armstrong
LUNG INJURY BY IMPACT WITH A WATER SURFACE. — Nature (London), 175 (4455): 504-505. March 19, 1955. DLC (Q1.N2, v. 175)

The velocity of impact with a water surface necessary to produce the chest-wall motion specified by Penney and Bickley as critical in producing severe lung injury (66 ft./sec. acquired in 0.5 msec.) was calculated from Richardson's assumption that in water impact at any particular instant a sphere carries with it an "added mass" of water equal to that in a hemisphere erected on the wetted perimeter. Assuming that the chest is a sphere and that the radius of the wetted perimeter is c at the instant considered, the equation for the initial impact velocity V becomes $V/v_c = 1 + 3\mu/2cp$, where v_c = velocity of the immersed part of the chest wall (critical chest velocity), μ = mass of chest wall, and p = density of the liquid. Diffuse pulmonary concussion was observed in guinea pigs projected belly-first into a tank of water at velocities greater than 104 ft./sec., a velocity consistent with the predicted value.

5013
Stewart, W. R.
NEW HORIZONS IN RESEARCH. — Flying, 56 (4): 42; 50. April 1955. DLC (TL501.P6, v. 56)

Included among the research projects of the School of Aviation Medicine at San Antonio, Texas, are studies dealing with (1) alkalosis of pilots caused by hyperventilation; (2) a re-study of morphine, its undesirable effects (respiratory depression, nausea, loss of muscle coordination); (3) development of the morphine antagonist Nalline; (4) screening new motion sickness drugs; (5) establishment of a reliable criterion for selecting future officers who show no predisposition for circulatory disability; and (6) determination of whether or not hypoxia was the cause of an aircraft accident by examining a tissue sample from a hypoxic pilot.

5014
Stewart, W. R.
PERILS OF SPACE FLIGHT. — Flying, 56 (6): 30-32; 71. June 1955. DLC (TL501.P6, v. 56)

The problems of space flight are briefly examined and their possible solution under simulated conditions is contemplated. Provision of a sealed space cabin with an adequate oxygen supply, protecting it from intense solar and cosmic radiation and meteorites, and managing the states of subgravity and weightlessness include some of the problems under study.

5015
Stilson, C. B.,
and E. Nalle
FIELD EVALUATION OF PLASTIC CUSTOM-MOLDED EAR DEFENDERS. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-63, Aug. 1955. 3 p. AD 78 156 UNCLASSIFIED

Acoustic protection provided by custom-molded earplugs and by standard item (MSA) ear defenders was evaluated by audiometric tests given flight-line personnel. The potential protection afforded by the MSA ear defender, at frequencies ranging from 250 to 8000 c.p.s., was two to three times greater than that given by the custom-molded earplug. (AD abstract)

5016
Stingely, N. E.
STRUCTURAL TESTS CONDUCTED ON AEROMEDICAL EVACUATION LITTER. — Wright Air Development Center, Wright-Patterson Air Force Base, Ohio. Technical Note no. WCRD 55-6, March 1955. iv+16 p. AD 78 281 UNCLASSIFIED

Static tests made of standard medical aluminum pole litters are described. It was found that as presently constructed, the rigid aluminum pole litter is inadequate for patient protection when used during aeromedical evacuation. Suggested modifications are presented.

5017
Stoll, A. M.
HUMAN TOLERANCE TO POSITIVE G AS DETERMINED BY PHYSIOLOGICAL END POINTS. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5508, Aug. 30, 1955. v+19 p. (Project no. NM 001 100 302, Report no. 2). AD 75 326 UNCLASSIFIED

Also published in: Jour. Aviation Med., 27 (4): 356-367. Aug. 1956. DLC (RC1050.A36, v. 27)

A method of analysis of experimental data covering a wide range of acceleration rates and positive g levels is described. The data are plotted as a strength-duration curve and found to conform to the usual physiological pattern except in the range of low g for exposure times longer than 6 seconds, wherein cardiovascular reflexes become effective. Comparisons with similar data from other laboratories indicate that good agreement is obtained when the time required to reach maximum g, as well as time at maximum, is taken into consideration. A nomogram relating approximate tolerance times to various g levels attained at various acceleration rates is derived empirically and discussed with respect to the influence of the rate of attaining g level on the total tolerance time. (Author's abstract, modified)

5018
Stone, I.
HELMET DESIGNED FOR SUPERSONIC BAILOUTS. — Aviation Week, 63 (24): 33-35. Dec. 12, 1955. DLC (TL501.A8, v. 63)

A full-face helmet for use in high-speed high-altitude bailout was developed as a combination helmet and face plate with hinge latches on both sides and a brow split line. The face plate may be opened from either side or removed. A large visual area is provided by a double lens with an air space between, fixed into the upper portion of the face plate. Oxygen mask and communication equipment are an integral part of the helmet design. It operates with the current oxygen supply systems for pressure breathing.

5019
Storti, D.
[JOB ANALYSIS AND ITS APPLICATION TO MILITARY AVIATION] Analisi del lavoro e sua applicazione nell'aeronautica militare. — Rivista aeronautica (Roma), 31 (8): 873-878. Aug. 1955. In Italian. DLC (TL504.R54, v. 31)

The principles of job analysis may be applied to the following areas of military aviation: (1) recruitment, selection, and utilization of personnel, by establishing psycho-physical tests and classification systems; (2) training of personnel, by formulating appropriate training programs; (3) organization, by grouping personnel according to their functional capacities; (4) classification of personnel, by standardizing the prerequisites for each job; (5) in the technico-logistic field, by suggesting the type of equipment to be used in each job; (6) in personnel guidance and aid, and (7) in the field of careers and administration.

5020
Stovall, W. R.
THE FUTURE OF AVIATION MEDICINE AS A SPECIALTY. — Jour. Aviation Med., 26 (2): 156-163. April 1955. DLC (RC1050.A36, v. 26)

The author presents a discussion of aviation medicine, past, present, and future, as a specialty. He describes the development of the science from its early days during World War I through the formative years up to the Second World War, the present, and into the future. Civil aviation medicine is discussed under four main headings: clinical, research, teaching, and administrative. The author feels that the opportunities for the young physician in this field are greatest in the clinical career; the research, teaching, and administrative opportunities are also encouraging. The future holds even greater opportunities for the physician specializing in aviation medicine, if he can maintain the pace set by developments in this young science.

5021
Strategic Air Command
GUIDE TO OCCUPATIONAL HEALTH PROGRAM. — Headquarters Strategic Air Command, Offutt Air Force Base, Nebraska. SAC Technical Pamphlet no. 160-5, Nov. 1955. 2+iii+70 p. DNLM

A consultative guide is presented for the establishment and operation of an occupational health program (AFR 160-20) at local installations of the Strategic Air Command. Basic concepts and purposes of the program are discussed, comprising preplacement and periodic physical examination, diagnosis of occupational diseases, health education, control of the occupational environment, human engineering, and preventive dentistry. Detailed information on the physiological tolerance, symptoms, and treatment of selected U.S.A.F. chemical exposures is presented. Brief reviews are presented of (1) the sources, injurious effects, and method of action of ionizing, ultraviolet, and microwave radiation, noise, abnormalities of pressure and temperature, and vibratory contact; (2) recommended physical standards for specialized occupational groups; and (3) a standard periodic physical screening examination.

5022
Stratton, K. L.
MEDICINE'S IMPORTANCE IN AVIATION. — New York State Jour. Med., 55 (8): 1129-1135. April 15, 1955. DNLM

The personal physician of a pilot or flight crew member plays an important role in the treatment of any pathological conditions diagnosed and referred to him by the flight surgeon, in compensation cases, and in confirming or disagreeing with the flight surgeon on whether or not a pilot should discontinue flying. Mention is made of the new concepts and future trends in aviation medicine, and of the developing public health problems associated with the advent of rapid intercontinental transportation. The aerial transportation of wounded and sick patients is discussed with special consideration to the specific problems encountered in the transport of patients with cardiovascular and respiratory diseases, blood dyscrasias, and metabolic disorders, of pregnant women, infants, mental and surgical patients, and those with contagious diseases.

5023
Strode, J. W.,
and M. W. Amster
A CLINICAL VIEW OF MOTION SICKNESS RESEARCH. — Internat. Record Med. 168 (2): 61-65. Feb. 1955. DLC (R11.M745, v. 168)

Included in a table of the drugs effective against motion sickness are the following drugs with their average single dose: hyoscine, Dramamine, Benadryl, Bonamine, Phenergan, Trimeton, Cyclizine, Pyrrolazote and Parsidol. The side effects, such as sedation, of effective drugs are considered and Bonamine is found to be the remedy of choice since it is inexpensive, requires single daily doses,

has a long duration of action (24 hours), and a lack of side effects. (40 references)

5024
Strollo, M.
[AN ASPECT OF INTELLECTUAL ACTIVITY IN HYPOXIA: EXPERIMENTAL OBSERVATIONS] Un aspetto dell'attività intellettiva in ipossia: osservazioni sperimentali. — Rivista di medicina aeronautica (Roma), 18 (3): 688-708. July-Sept. 1955. In Italian, with English summary (p. 706).
DLC (TL555.A1R5, v. 18)

The mental activity was tested of 100 subjects of the same profession and cultural level (21-23 years of age) at sea level (zero meters of altitude) and at a simulated altitude of 5,500 meters in a decompression chamber. All subjects performed the task of simple subtraction. Hypoxia was found to affect both the mechanisms of mental activity and the graphologic psychomotor performances. Numbers became indistinct, coarse, larger and out-of-proportion. An increased amount of corrections and percentage of errors was observed. This test appears to be of value in the selection of flight personnel, who, on occasion might be exposed to hypoxic conditions.

5025
Ström, G.
[VIEWS ON THE SPECIALIZED EXAMINATION OF THE CIRCULATORY ORGANS IN PILOT CANDIDATES] Synpunkter på specialundersökning av cirkulationsorganen hos flygföraraspiranter. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (1): 1-14. 1955. In Swedish, with English summary (p. 13). DNLM

This is a review of various clinical, roentgenological and physiological diagnostic methods used in the examination of the cardiovascular system of applicants for pilot training in the Swedish Air Force. A thorough knowledge of the limitations inherent in the diagnostic techniques and of the normal range of values for physiological functions is necessary, as well as of the demands on the cardiovascular system imposed by flight. The examination results of a group of applicants and another group of young men are described. (Author's summary, modified)

5026
Stroud, M. W.,
C. J. Lambertsen, J. H. Ewing, R. H. Kough, R. A. Gould, and C[arl] F. Schmidt
THE EFFECTS OF AMINOPHYLLINE AND MEPERIDINE ALONE AND IN COMBINATION ON THE RESPIRATORY RESPONSE TO CARBON DIOXIDE INHALATION. — Jour. Pharmacol. and Exper. Therapeutics, 114 (4): 461-469. Aug. 1955.
DLC (RS1.J85, v. 114)

The respiratory responses to ascending concentrations of inspired and alveolar carbon dioxide were studied in normal subjects after the administration of aminophylline alone and in combination with meperidine. It was found that at an alveolar CO_2 pressure of 46 mm. Hg, 3 and 6 mg./kg. of aminophylline increased the respiratory minute volume 46 and 98%, respectively; the tidal volume was increased by both doses, the respiratory rate only by the larger dose. Aminophylline administered together with meperidine counteracted most of the respiratory depressant effects of meperidine.

5027
Strughold, H.,
THE ECOSPHERE OF THE SUN. — Jour. Aviation Med., 26 (4): 323-328. Aug. 1955.
DLC (RC1050.A36, v. 26)

The ecosphere of the sun or the helioecosphere, is a biologically defined concept [signifying the sphere in which organic life can exist]. It indicates a zone surrounding the sun in which the radiation on the one hand does not exceed the ecological maximum, and on the other hand does not fall below the ecological minimum. Considering the various ecological factors, we may speak of a "biotemperature belt", a "liquid water belt", and an "oxygen belt" in the planetary system. They all lie in about the same area around the sun. The term, "ecosphere of the sun", covers all of them; and the decisive factor is the distance from the sun. In our planetary system, the ecosphere evidently extends from the area of Venus to beyond Mars, roughly from 50 to 150 million miles from the sun. The solar ecosphere is a relatively narrow zone within the planetary area. The ecosphere of the sun represents a globular shell, but the planets in our solar system revolve in about the same plane so that most of the shell of the ecosphere is not used. (Author's summary, modified)

5028
Strughold, H.
THE MEDICAL PROBLEMS OF SPACE FLIGHT. — Internat. Record Med., 168 (9): 570-575. Sept 1955.
DLC (R11.M745, v. 168)

Regulation of the oxygen supply; control of temperature, humidity and odors; protection from cosmic and ultraviolet rays and meteorites; and management of the reversed light distribution and the physiological diurnal cycle are problems to be encountered in space flights. In addition, movement of the vehicle through the environment encountered at extreme altitudes, with supersonic speed, poses the problems of cabin climatization and the effects of weightlessness.

5029
Strughold, H.,
and W. F. Taylor
THE OCULOMOTORIC PATTERN OF CIRCULAR EYE MOVEMENTS DURING INCREASING SPEED OF ROTATION [Abstract]. — Amer. Psychologist, 10 (8): 490-491. Aug. 1955.
DLC (BF1.A55, v. 10)

The saccadic eye movements of 10 male subjects were photographed when following the movement of a fixation mark on a rotating black disk. Three experiments were made with (a) a constant rotational speed of 15 r.p.m. over a period of 30 seconds; and during gradually increasing speeds from (b) 20 to 45 r.p.m., and (c) 40 to 85 r.p.m. All experiments included clockwise and counterclockwise rotations. The results suggest that the changes in speed of rotation are associated with changes in the frequency of saccadic eye movements. Increasing speed results in fewer movements per revolution of the target image, and in more movements per second. A higher number of eye movements occurred during counterclockwise rotation than during clockwise pursuit. An analysis of variance of the data on the extent of saccadic movements showed an increase in magnitude with

increase in rotation speed. By combining the findings on number and extent of movements, one can conclude that as the rotational speed increases the eye movements become more frequent and extensive.

5030
Strughold, H.
PHYSIOLOGIC DAY-NIGHT CYCLE AFTER LONG DISTANCE FLIGHTS. — Internat. Record Med., 168 (9): 576-579. Sept. 1955.
DLC (R11.M745, v. 168)

The phenomenon of incomplete diurnal cycle adaptation imposed by long distance flights (global flights, and more so in future global space flights) is discussed. The phase shift in the diurnal cycle is caused by traveling with or against the rotation of the earth, along the latitudes, across the meridians, or along the meridians across the poles. The time element is considered from the medical and social viewpoints.

5031
Strumza, M. V.
[THE PLACE OF ARTIFICIAL RESPIRATION IN AVIATION MEDICINE] Place de la respiration artificielle en médecine aéronautique. — Médecine aéronautique (Paris), 10 (4): 475-478; discussion, p. 478-479. 1955. In French.
DLC (TL555.M394, v. 10)

The role of artificial respiration in the treatment of respiratory arrest due to anoxia is discussed. The method is seen to be of little use for the following reasons: (1) A spontaneous agonal respiration occurs 30 to 60 seconds after the initial arrest. (2) The agonal respiration, unless occurring in an oxygen-rich atmosphere, is followed immediately by secondary apnea leading to arterial collapse. Reoxygenation by any means is impossible at this stage unless the blood circulation is restored to a pressure of at least 50 mm. Hg. Thus in anoxia the immediate application of an oxygen mask during primary apnea, or this procedure accompanied by cardiac massage and artificial respiration during secondary apnea, is required.

5032
Stuteville, J. H.
AEROMEDICAL ASPECTS OF HIGH ALTITUDE HIGH SPEED FLIGHT. — Tactical Air Command Surgeon's Bulletin, 5 (11): 1-10. Nov. 1955.
DNLM

Basic concepts of the physical and physiological problems of high altitude, high speed flight are discussed, including the composition of the atmosphere, the relation between the oxygen content of blood and of inspired air, the oxygen requirements of tissues, the effect of acceleration on blood pressure, and the mechanical basis for air compression systems. Problems of temperature control, ejection escape, and visual inadequacy during high speed flight are briefly reviewed.

5033
Suelter, C. H.
EVALUATION OF AN AIRCRAFT TOILET SERVICING UNIT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-78, Sept. 1955. iv+8 p. AD 91 707 UNCLASSIFIED

An aircraft toilet servicing unit developed by the Wickland Manufacturing Company was tested by the Military Air Transport Service at Travis Air Force Base, California. A conference of representatives of all major commands concluded from the results of the testing that several operational changes were necessary.

5034
Sundén, Å.
[WHICH PHYSIOLOGICAL PROBLEMS DOES THE AEROTECHNOLOGICAL DEVELOPMENT PRESENT] Vilka fysiologiska problem medför den flygtekniska utvecklingen? — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (3): 15-17. 1955. In Swedish.
DNLM

The author discusses new advances in fighter aircraft by 1960, which in turn will demand improved equipment standards to protect the pilot against the effects of high altitudes, acceleration, rapid changes in pressure and temperature, cosmic radiation, etc. Research should be accelerated on protective suits for ejection at high altitudes and high speed, comfortable clothing with less bulk, comfortable, well-lighted cockpit with easily accessible instrument panel, and catapult equipment. Physiological instruction programs should also be intensified.

5035
SUPERSONIC BALE-OUT. — Flight (London), 68 (2445): 836. Dec. 2, 1955. DLC (TL501.F5, v. 68)

Two cases of ejection at supersonic speed are described. The pilot of a British Hunter jet bailed out during a steep dive at 25,000 ft, suffering a broken arm and blackened eyes from high wind force. The pilot of an American F-100A bailed out at 6500 ft. during a steep dive. Improperly positioned in his seat and subjected to very strong deceleration, air pressure, and buffeting, he suffered multiple internal injuries, eye hemorrhages, and bruises.

5036
Surtshin, A.,
J. Hoeltzenbein, and H. L. White
SOME EFFECTS OF NEGATIVE PRESSURE BREATHING ON URINE EXCRETION. — Amer. Jour. Physiol., 180 (3): 612-616. March 1955.
DLC (QP1.A5, v. 180)

In normal dogs and human subjects, breathing of air at about -10 mm. Hg. from a reservoir usually induces increase in urine flow. Creatinine and sodium excretion in human subjects are unaffected by this procedure. In dogs with unilateral renal denervation and ureteral explants, increases in urine volume and sodium excretion were less frequent than in normal dogs and human subjects, but when they occurred the effects were the same on the two sides. No consistent increase in rate of inulin excretion from either side was seen during negative pressure breathing. (Authors' summary)

5037
Suttell, B. J.
EVALUATING POTENTIAL OFFICER EFFECTIVENESS IN A TRAINING SITUATION. — Jour. Applied Psychol., 39 (5): 338-342. Oct. 1955.
DLC (BF1.J55, v. 39)

A situational performance test was developed for evaluating potential effectiveness during the officer training program. Situational problems designed to elicit behavior critical to effective Air Force Junior administrative officer performance were ad-

ministered under standardized test conditions to 480 Air Force officer candidates. Trained examiners observed and recorded candidates' behavior on a behavior list. Estimates of test reliability by the Kuder-Richardson formula 20 gave a coefficient of .68. The correlation coefficients obtained between total test scores and Officer Candidate School evaluation measures were: (1) with flight-mate paired-comparison ratings, .21; (2) with tactical officer paired comparison ratings, .24; (3) with final military class standing, .24; and (4) with final academic grade, .25. It is concluded that the situational test has potential value in two areas: (a) in providing an interim criterion measure for the development of more economical selection and evaluation devices, and (b) in supplementing the present training program. (From the author's summary)

5038
Svorad, D.
[THE EFFECT OF LOWERING THE BODY TEMPERATURE ON THE TENDENCY TO INHIBITION] L'effet de l'abaissement de la température du corps sur l'aptitude à l'inhibition. — Physiologia bohemoslovenica (Praha), 4 (2): 178-182. 1955. In French, with Russian summary (p. 182). DLC (QP1.C417, v. 4)

"Paroxysmal inhibition" [death-feigning or cataplexy] may be induced in rabbits and rats by rotation [about the longitudinal axis]. The duration of paroxysmal inhibition decreased after suppression of cortical postural reactions resulting from hypothermia. Exclusion of mesencephalic righting reflexes by further lowering of the body temperature results in a lengthening of the duration of paroxysmal inhibition. Righting reflexes appear to play a decisive role during the genesis and duration of paroxysmal inhibition induced by the rotation method.

5039
Svorad, D.
[SELECTIVE EXCLUSION OF POSTURAL REFLEXES BY MEANS OF HIBERNATION OF THE ORGANISM] L'exclusion sélective des réflexes posturaux au moyen de l'hibernation de l'organisme. — Physiologia bohemoslovenica (Praha), 4 (2): 170-177. 1955. In French, with Russian summary (p. 177). DLC (QP1.C417, v. 4)

Hypothermia induced in rabbits and rats (by exposure to a cold environment) produced a gradual functional elimination of cortical postural reactions and mesencephalic righting reflexes. In the rabbit, lowering the rectal temperature to 26-21° C. resulted in inhibition of all cortical placement reactions. Further lowering of the body temperature to 18-14° C. caused loss of the mesencephalic righting reflex. In the rat, these reflexes were suppressed as the body temperature dropped to 21-17° C. Selective exclusion of specific postural reflexes may be realized by cooling the body to a certain temperature.

5040
Swartz, P.,
R. F. Green, B. Weiss, H. Zimiles, and S. D. S. Spragg
THE EFFECTS OF FRICTION ON THE ACCURACY OF KNOB SETTINGS. — Univ. of Rochester, New York (Contract N6onr-241, T.O. 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-14, Aug. 1, 1955. 7 p. (SPECDEVCEN Project no. 20-M-1d). AD 109 236 UNCLASSIFIED

Two experiments were conducted to study the effects of friction on the accuracy of bisecting angles by tuning or focusing control knobs in a "dead zone". In Experiment I, 20 male college students were required to make a series of settings with each of five frictions and each of four angles: 40°, 80°, 120°, and 160°. Experiment II used 80 military men who performed on all four angles, but used just one of the five frictions throughout. The results taken as a whole show that dry friction has no important influence on the mean accuracy of knob settings. When the results are broken down, however, so that the effect of friction at each angle can be seen, there is some evidence in both experiments that friction reduces error at the 40° angle. There is a definite tendency for variability to increase as the friction becomes greater. As a general rule, in a system to be controlled by attempting to bisect a dead zone with a control knob, the frictional load should be kept as low as is practical and an angular zone of uncertainty of 120° to 160° should be provided.

5041
Sydnor, K. L.,
M. L. Sweat, G. Sayers, and H. B. Hale
BLOOD ACTH AND CORTICOSTEROIDS IN MAN EXPOSED TO ENVIRONMENTAL STRESS. — Western Reserve Univ. School of Medicine, Cleveland, Ohio; and School of Aviation Medicine, Randolph Field, Tex. Report no. 55-22, April 1955. 6 p. AD 75 200 UNCLASSIFIED

Blood ACTH and plasma adrenocorticosteroid titers were determined on nine groups of normal male subjects under the following experimental conditions: (1) control subjects breathing air at room temperature for 15 or about 45 minutes; (2) subjects exposed to simulated altitude at 14,000 feet (breathing 12 per cent oxygen in an atmosphere of nitrogen) for 2, 15, or 45 minutes; (3) subjects exposed to heat (120° F.) for 15 or for 45 minutes; and (4) subjects exposed to hypoxia plus heat at 120° F., for 15 or for 45 minutes. The blood ACTH titer of 1 control subject was estimated to be 2.0 milliunits, that of 1 subject exposed to heat for 45 minutes was 0.75 milliunits, and that of the remaining 52 subjects was less than 0.5 milliunits per 100 ml. The mean 17-hydroxycorticosterone concentration in plasma of control subjects was 10.8 mg. and the mean concentration of corticosterone-like compounds was 5 mg. per 100 ml. The differences between the control and the experimental groups were not highly significant. It is concluded that the stresses employed did not appreciably activate the pituitary-adrenal system of these subjects. (Authors' conclusions)

5042
SYNCOPE IN FLYERS. — Tactical Air Command Surgeon's Bulletin, 5 (1): 14-15. Jan. 1955. DNLM

The discovery that a jet pilot involved in a recent fatal aircraft accident had been taking Dilantin and had suffered from epilepsy for a period of several years is cited to emphasize the significance of reported incidences of "fainting" in the physical qualification of pilots.

5043
Tabusse, L.
[AVIATION AND PULMONARY TUBERCULOSIS] Aviation et tuberculose pulmonaire. — Semaine des hôpitaux de Paris (Paris), 31 (17): 980-987. March 14, 1955. In French. DNLM

A review is presented of clinical and experimental observations of symptoms of pulmonary tuberculosis in flight. The advisability of flying is discussed for post-surgical patients and for cases of healed lesions (parenchymatous calcification), bacillary lesions, intra-pleural and extra-pleural pneumothorax, and pneumoperitoneum. It is concluded that: (1) the development or reappearance of tuberculosis is favored by hyperventilation, vascular dilatation, and traumatization of lesions encountered during flight; (2) administration of antibiotics in the treatment of tuberculosis may indirectly cause air sickness by disturbance of the vestibular and digestive organs; and (3) patients with intra-pleural pneumothorax and pneumoperitoneum tolerate exposure to altitude fairly well, while patients with extra-pleural pneumothorax do not.

5044
Tanche, M.
[CHLORPROMAZINE AND BARBITURATES IN THE STRUGGLE AGAINST COLD] Chlorpromazine et barbituriques dans la lutte contre le froid. — Comptes rendus de la Société de biologie (Paris), 149 (15-18): 1561-1564. Aug.-Sept. 1955. In French. DLC (QP1.S7, v. 149)

Dogs were exposed to an ambient temperature of -12° C. for 30 minutes, after injection of chlorpromazine or pentobarbital, or for an additional 30 minutes after a second injection. The metabolic rate was found to be unchanged by chlorpromazine, but was decreased sharply by pentobarbital. Shivering, which was unaffected by chlorpromazine alone, was eliminated by pentobarbital and again, after its return, by a subsequent injection of chlorpromazine. Rectal temperature decreased to a constant level under chlorpromazine, and decreased progressively to a lower level under pentobarbital.

5045
Taylor, C. L.
HEAT-TRANSFER APPLICATIONS IN THE HUMAN BODY. — Mechanical Eng., 77 (6): 511-513. June 1955. DLC (TJ1.A72, v. 77)

The biophysical and physiological aspects of heat exchange between the human organism and its environment are reviewed. The central nervous thermoregulatory mechanisms are pictured as similar to a dual thermostatic control which activates both heating and cooling units. The thermal "steady states" are summarized in regard to the range of thermal neutrality with relative comfort, and states of compensated hyper- and hypothermia. The thermal transitory states occur when the thermal extremes, either heat or cooling, exceed the human thermoregulatory capacity to compensate; thermal storage takes place until it reaches the voluntary tolerance limit. Continued thermal storage produces hyper- or hypothermic breakdown. Biotechnical methods in the design of human thermal environments are enumerated. The development of a biothermal analog computer is at present in the experimental stage.

5046
Taylor, D. W.
EFFECTS OF VITAMIN E DEFICIENCY AND OF METHYLENE BLUE ON OXYGEN TOXICITY IN THE RAT [Abstract]. — Jour. Physiol. (London), 129 (3): 62P-63P. Sept. 28, 1955. DLC (QP1.J75, v. 129)

Rats received from weaning an identical basic diet supplemented or not with α-tocopheryl acetate (E), methylene blue (M), or both (ME). When the animals were exposed at the age of 6 1/2 months to 5 atmospheres of oxygen, E deficiency was seen to decrease significantly the time to prostration. While the addition of M to the diet decreased this sensitivity, the addition of ME had no effect. Gross hemolysis and an increase in lung damage observed in the E deficient animals were unaffected by M.

5047
Teichner, W. H.,
J. L. Kobrick, and E. Ralph Dusek
COMMONPLACE VIEWING AND DEPTH DISCRIMINATION. — Jour. Optical Soc. Amer., 45 (11): 913-930. Nov. 1955. DLC (QC350.Q6, v. 45)

Measures of commonplace depth discrimination were obtained at observation distances of 200, 750, and 1500 feet in an Arctic area over flat terrain. Comparisons were made with similar measures taken over four different kinds of terrain (including an airstrip) in a desert area and with similar data reported by other investigators. The results indicate that within a range of 1000 to 3000 feet the standard deviation (precision) of depth discrimination is related to observation distance (D) approximately as the function, $D^{1.35}$. Within the same range the associated binocular image disparity decreases approximately as $D^{-0.65}$. It is suggested that for commonplace viewing the angle of disparity is better conceived of as a measure of relative depth acuity rather than of stereoscopic acuity. The results also suggest that under the conditions studied commonplace depth acuity is 95-100% finer than stereoscopic acuity alone, binocular acuity is only slightly, if at all, superior to monocular acuity, and that the qualities of the terrain such as its texture have little or no effect. It was concluded that stereoscopic vision makes only a slight contribution to the precision of depth discrimination although it may be very important in producing a feeling or effect of depth. The hypothesis was put forth that vernier acuity is the major basis for commonplace depth discrimination. (Authors' abstract)

5048
Teichner, W. H.,
and J. L. Kobrick
EFFECT OF PROLONGED EXPOSURE TO LOW TEMPERATURE ON VISUAL-MOTOR PERFORMANCE. — Jour. Exper. Psychol., 49 (2): 122-126. Feb. 1955. DLC (BF1.J6, v. 49)

Essentially the same as item no. 3537, vol. III.

5049
Tenney, S. M.,
and C. R. Honig
THE EFFECT OF THE ANTI-G SUIT ON THE BALLISTOCARDIOGRAM: REVERSAL OF NORMAL RESPIRATORY VARIATION AND CHANGE IN THORACIC BLOOD VOLUME. — Jour. Aviation Med., 26 (3): 194-199. June 1955. DLC (RC1050.A36, v. 26)

The standard U. S. Air Force pneumatic anti-g suit (type G-4A) when inflated to a pressure above 75 mm. Hg caused a diminution or reversal of normal respiratory variation of the systolic complexes of the ballistocardiogram. Indirect evidence has been presented to show that the pulmonary blood reservoir is enlarged at the time the respiratory variation is reversed from normal, and with this observation an explanation has been sought for the change in right and left ventricular force relationships. (Authors' summary)

5050
Terzioğlu, M.,
C. Göral, and J. Bardavit
INFLUENCE OF CHEMORECEPTOR DENERVATION AND SUBSEQUENT DISCONTINUOUS ANOXIA ON ERYTHROPOIESIS AND ACID-BASE EQUILIBRIUM IN THE RABBIT. — Amer. Jour. Physiol., 182 (1): 100-104. July 1955. DLC (QP1.A5, v. 182)

Changes in erythropoietic response and acid-base equilibrium under hypoxia were studied in rabbits after denervation of the carotid and aortic areas. Intermittent exposure to environmental pressures of 400-410 mm. Hg produced an intense polycythemia, with increases in erythrocyte count and hemoglobin concentration continuing for 150 hours after exposure. Reticulocyte counts, elevated initially by denervation, remained at a high level for 50 hours after exposure. Unilaterally denervated animals showed an increased erythropoiesis midway between the response of bilaterally denervated animals and that of controls. Inhalation by denervated animals of an 8.5-10.5% O_2 mixture for short periods caused the percentage O_2 saturation in arterial blood to fall to levels existing in venous blood. A rise in blood pH occurring with an increase in CO_2 content was attributed to decreased oxygen saturation and the subsequent presence in the blood of greater amounts of reduced hemoglobin.

5051
Thauer, R.
[PHYSIOLOGY OF THERMOREGULATION] Physiologie der Wärmeregulation. — Acta neurovegetativa (Wien), 11 (1-4): 12-37. 1955. In German, with English summary (p. 35-36). DNLM

The laws governing heat production and heat exchange with the environment in the homoiothermic organism are surveyed. Only the organs capable of increasing heat production, the circulatory system, the excretory organs, and the respiratory passages are active thermoregulators. The quantitative relation between the extent of thermic stress and the reactions of various organ systems are reviewed including the recent knowledge of the mechanisms of these reactions. The problem of the localization of the central thermoregulatory processes is as yet unsettled. The hypothalamus is implicated and the peripherally situated parts of the central nervous system also participate, particularly in thermoregulation against cold which is maintained even after complete elimination of the hypothalamus. The absolute temperature of the skin is seen as the deciding factor for the release of thermoregulatory processes. The blood temperature is probably effective in the regulation of the body temperature and stimulation of the regulatory organs.

5052
Thaysen, J. H.,
and I. L. Schwartz
FATIGUE OF THE SWEAT GLANDS. — Jour. Clinical Investigation, 34 (12): 1719-1725. Dec. 1955. DLC (R11.J67, v. 34)

Sweating was stimulated in young unacclimatized males in a hot room (40°-45° C.). A decrease in sweat flow was observed after long exposure to heat in four experiments lasting 5-6.5 hours. It is suggested that the decrease in reflex sweating produced by environmental heat is due to fatigue of the glandular units and not to decreased central nervous stimulation. Apparently sweating can continue indefinitely at the same rate only if the demand on the secretory mechanism does not exceed simultaneous processes that operate to restore secretory function. When the demand upon the secretory mechanism exceeds the capacity for restoration of function, the sweating rate decreases.

5053
Theilen, E. O.,
D. E. Gregg, and A. Rotta
EXERCISE AND CARDIAC WORK RESPONSE AT HIGH ALTITUDE. — Andean Institute of Biology, Lima, Peru; and Walter Reed Army Medical Center. Army Medical Service Graduate School, Washington, D. C. AMSGS-26-55, Sept. 1955. 10 p. (Project no. 6-60-13-017, Subtask no. 6). AD 83 393 UNCLASSIFIED
Also published in: Circulation, 12 (3): 383-390. Sept. 1955. DLC (RC681.A1C5, v. 12)

The response of the left ventricle to treadmill exercise was studied in natives of Morococha, Peru (elevation 14,900 feet), and in natives of Lima, Peru (elevation 500 feet). In both groups the external work of the left ventricle was effected by a combination of a large increase in cardiac output and a mild increase in systemic blood pressure. Stroke volume and stroke work were only mildly elevated since the heart rate was concurrently greatly increased. As a result, the increase in work of the left ventricle was largely accomplished by an increase in heart rate and to a lesser extent by an increase in stroke work. For comparable amounts of external work, the left ventricle of the natives of high altitudes, and performing at high altitudes, responded with considerably greater effort than did the left ventricle of the natives of low altitudes performing at sea level. Some of the data may have approximated the maximum effort of which the normal left ventricle was capable. (Authors' abstract, modified)

5054
THIS MEAL MEANS SURVIVAL. — Canad. Aviation (Toronto), 28 (5): 46-48. May 1955. DLC (TL501.C33, v. 28)

The experimental survival expedition of 9 RCAF officers equipped only with items contained in the standard emergency parachute pack is described. After ten days in sub-zero weather, the men had lost an average of 11 lb. each, but were in excellent physical condition.

5055
Thomsen, K. A.
EUSTACHIAN TUBE FUNCTION TESTED BY EMPLOYMENT OF IMPEDANCE MEASURING. — Acta oto-laryngologica (Stockholm), 45 (3): 252-267. May-June 1955. In English. DNLM

A new method for the determination of eustachian tube function is described. Threshold pressure for the opening of the eustachian tube is determined by measuring changes in acoustical impedance occurring when a measured increase in nasopharyngeal pressure is transferred to the middle ear during deglutition. In cases of obstruction of the tube, the threshold pressure is increased, and an absorption curve derived from the measurement of impedance after one or more deglutitions varies from normal.

5056
Thorn, W.,
G. Pfleiderer, R. A. Frowein, and I. Ross
[BRAIN METABOLISM DURING ACUTE ANOXIA, ACUTE ISCHEMIA, AND DURING RECOVERY] Stoffwechselvorgänge im Gehirn bei akuter Anoxie, akuter Ischämie und in der Erholung. — Pflügers Archiv für die gesamte Physiologie (Berlin), 261 (4): 334-360. 1955. In German.
DLC (QP1.A63, v. 261)

A rapid rise in inorganic phosphate, fructose diphosphate, and ADP, and a slow decrease in adenosine triphosphate were observed in the brains of rabbits during short periods of cerebral ischemia or respiratory asphyxia (5% CO_2 in N_2). Recovery after cessation of anoxia was rapid. Lactic acid increased slowly during anoxia and was still elevated 30 minutes after the end of the anoxic period. Labile phosphate in the form of phosphocreatine is considered to be the essential factor in the recovery of the animal. As a quick energy source, it fell by 50% within a few seconds after initiation of anoxia. Its disappearance within 2 minutes was followed shortly by the death of the animal. Blood pressure, pulse rate, and the electric potential patterns of the brain and heart were all altered by anoxia.

5057
Thorndike, R. L.,
and E. Hagen
VALIDATION OF THE ELECTRONICS TECHNICIAN SELECTION TEST AT SELECTED CLASS 'A' SCHOOLS. — Columbia Univ. Teachers College, New York (Contract Nonr 644(02)); issued by Bureau of Naval Personnel. Personnel Analysis Div., Washington, D. C. Technical Bulletin no. 55-3, April 15, 1955. vi+65 p. AD 72 856
PB 123745

The Electronics Technician Selection Test was validated against criteria of success (typically final grade) in 10 different class A technical schools which were thought to involve in some degree the same type of electrical and electronic knowledge taught in the Electronics Technician (ET) school. The validity of the ET Selection Test (ETST) was compared in each case with the validity of the tests in the Navy basic battery. Findings indicate a wide range of usefulness of the ETST within the 10 schools. The ETST total score was the most valid single predictor in 8 of the 12 sets of data. In the ET, Internal Communications School (Great Lakes, Ill.) and Tradevman School (Memphis, Tenn.), the multiple correlation was increased as much as 0.05 by including the ETST. In the Radiomen and Aviation Ordnance schools, the ETST had little value. It is suggested that in certain cases use of the ETST could result in significant improvement in the selection of entering personnel. (AD abstract, modified)

5058
3520th Combat Crew Training Group
SOME EFFECTS OF SYNTHETIC TRAINERS IN A B-47 TRAINING PROGRAM. — Training Analysis and Development Division, 3520th Combat Crew Training Group, McConnell Air Force Base, Kansas; issued by Air Training Command (Project no. 54-18). Final Project Report, Feb. 22, 1955. 3+ 18+9 p. AD 76 533 UNCLASSIFIED

The effect of C-11 Link training on B-47 flight proficiency was determined through objective and subjective evaluation of the performance in training on the B-47 simulator and in B-47 flight of students trained or not on the C-11 trainer. C-11 training was found to have a significant (early) effect on B-47 simulator performance, but not on B-47 flight performance. The effect of B-47 simulator training on B-47 flight performance was greater than the effect of C-11 training on B-47 simulator performance. Performance in the B-47 air training situation was successfully predicted from performance on the B-47 simulator. It is suggested that C-11 training be eliminated from the B-47 training program.

5059
Thwing, E. J.
SPREAD OF PERSTIMULATORY FATIGUE OF A PURE TONE TO NEIGHBORING FREQUENCIES. — Jour. Acoust. Soc. Amer., 27 (4): 741-748. July 1955. DLC (QC221.A4, v. 27)

An investigation was conducted to determine the extent to which the perstimulatory fatigue induced by a pure tone spreads to neighboring frequencies. Perstimulatory fatigue was measured by means of a series of simultaneous dichotic loudness balances made prior to, during, and subsequent to stimulation by a fatiguing tone of 1000 c.p.s. at a sound pressure level of 80 db. Fatigue measurements at frequencies other than that of the fatiguing tone were made during a 15-second interval in the fatiguing stimulus. The findings demonstrate that maximum fatigue is produced at the frequency of the fatiguing stimulus. Fatigue falls off rapidly on both sides of this frequency at a negatively accelerated rate until at 100 c.p.s. and 2500 c.p.s. little or no effect is evident. The gradients of perstimulatory fatigue are nearly symmetrical when plotted on a log-frequency scale. (Author's abstract, modified)

5060
Tikhov, G. A.
IS LIFE POSSIBLE ON OTHER PLANETS? — Jour. Brit. Astronom. Assoc., 65 (5): 193-204. April 1955. DLC (QB1.B75, v. 65)

A selective review is presented of observations suggesting the possibility of the existence of plant life on Mars. Objections to the theory of life on Mars are rejected categorically by reference to observations of extreme environmental adaptation in earth organisms. A hypothesis is presented which explains the paleobotany of Mars and Venus on the basis of observations of seasonal color changes as phylogenetic representations. The possibility of the existence of microorganisms on other planets is also discussed.

5061
Tfunov, L. A.
[SOME PROBLEMS IN CARBON MONOXIDE TOXICOLOGY] Nekotorye voprosy toksikologii okisi ugleroda. — Uspekhi sovremennoĭ biologii (Moskva), 40 (6): 307-319. Nov.-Dec. 1955. In Russian.
DLC (QH301.U7, v. 40)

A review is presented of the USSR and foreign literature on the subject, in which methods for the determination of CO in the air and of carboxyhemoglobin in the blood are discussed. The role played by the Pavlovian conditioned-reflex concepts in the study of CO poisoning and in its physiological effects is adequately analyzed, and the possibility of CO being oxidized to CO_2 in the organism, as suggested by Pokrovskii, is stressed. The endogenous CO formation in the organism, the effect of CO on different phases of metabolism and on the morphological condition of the blood are also mentioned.

5062
Tolhurst, G. C.
THE EAR IN COMMUNICATIONS. — In: Office of Naval Research, Symposium on physiological psychology, p. 229-239. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100 UNCLASSIFIED

The activities at the Acoustic Laboratory have been directed at defining some of the behavior of the individual as he may impart or receive information. The basic premise is that an individual functions as a nonlinear transducer whether in the process of encoding, transmission, or decoding. Experimentation is reviewed as concerned mainly with three general stages abstracted from the communications continuum, namely: (a) the code content of language; (b) the efficiency of the human transmitter, or encoding machine and the efficiency of the receiver, or decoding machine, plus their interactions; and (c) the characteristics of the transmission channel as it affects the efficiency of the human transceiver.

5063
Tolhurst, G. C.
THE EFFECTS OF AN INSTRUCTION TO BE INTELLIGIBLE UPON A SPEAKER'S INTELLIGIBILITY, SOUND PRESSURE LEVEL, AND MESSAGE DURATION. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 58, July 30, 1955. iii+15 p. (Project no. NM 001 104 500, Report no. 58). AD 94 574 PB 125866

Three criterion measures, namely, multiple-choice intelligibility scores, sound pressure level, and message duration measurements of five-syllable phrases, were obtained on 48 Naval Aviation flight students. One-half received an instruction to be as intelligible as possible before a second reading; one-half received no instructions. The results of the instruction were to improve intelligibility scores and to prolong the reading. No increase in sound pressure level of voice was found. (Author's abstract)

5064
Tolhurst, G. C.
INTELLIGIBILITY AS A FUNCTION OF CONSTANT SIDE-TONE LEVEL WHEN FREQUENCY RESPONSE AND SPEAKER'S VOCAL EFFORT ARE VARIED. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 46, March 30, 1955. iii+14 p. (Project no. NM 001 104 500.46). AD 62 422 PB 117649

The frequency response of a speaker's side-tone circuit was altered without affecting his intelligibility when the listeners received his speech in 114 db. of ambient noise. Significant differences in intelligibility resulted, however, when the listeners were in quiet. Changes in sound pressure level of a speaker's voice, up or down from a normal level, resulted in significant differences in speaker intelligibility scores. (Author's abstract)

5065
Tolhurst, G. C.
SOME EFFECTS OF CHANGING TIME PATTERNS AND ARTICULATION UPON INTELLIGIBILITY AND WORD RECEPTION. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 40, Jan. 31, 1955. iii-15 p. (Project no. NM 001 104 500.40). AD 62 325 PB 117620

Multiple-choice intelligibility items were read by one voice successively in a prolonged, a normal, and a staccato manner of delivery. The listener judgments indicated a preference for the normal and prolonged delivery over staccato; they also accorded different intelligibility values to the three conditions. When other speakers heard re repeated to listeners the words that they had heard recorded by one voice, the speakers' intelligibility scores varied in keeping with the precision of articulation of the original stimulus. Listener judgments of recorded, paired test items indicated that they could tell, with significantly better than choice frequency, differences between items that were precisely, normally, and slovenly articulated as the speakers repeated the items they heard. (Author's abstract)

5066
Tolhurst, G. C.
SPEAKER INTELLIGIBILITY OF REPEATED MESSAGES ACQUIRED BY VISUAL, AURAL OR VISUAL-AURAL CHANNELS. — Ohio State Univ. Research Foundation, Columbus (Contract N6ONR 22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. Joint Project Report no. 43, Feb. 28, 1955. ii+7 p. (Project no. NM 001 104 500.43). AD 62 339 PB 117652

Fifty-six Naval Aviation cadets spoke to 196 fellow listeners and received their verbal material by reading (visual channel), listening (aural channel) and by a combination of simultaneous reading and listening (visual-aural channel). Listeners and speakers were tested in "classroom-quiet" conditions. Statistically significant differences in speaker intelligibility scores were found between the visual and aural conditions, between the aural and visual-aural, but not between visual and visual-aural. (Author's abstract)

5067
Tomlinson, H.
DEVELOPMENT OF SHORT ALTERNATIVES OF FACTOR-REFERENCE TESTS FOR FIVE PRIMARY APTITUDES. — Air Force Personnel and Training Research Center, Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-6, June 1955. vi+22 p. (Project no. 7703, Task no. 77082). AD 72 430 PB 118630

A battery of short factor-reference tests is proposed as a short-cut technique for obtaining estimates of the factorial content of tests under development. On the basis of accumulated factorial

findings for the basic airman and similar populations, five areas were selected for developing a limited trial battery: verbal, numerical, mechanical, perceptual speed, and psychomotor speed. 10 short tests were administered to an airman sample with 10 full-length factor-reference tests and 14 other test variables. Analysis of the resulting correlation matrix by a multiple-group method showed the factor patterns of the experimental tests unequivocal in four areas. Development of short factor tests in additional factor areas will probably be most effective if the tests are assembled by a cluster analysis of short content-homogeneous subtests to produce some degree of test-task heterogeneity in each reference test. As appropriate test definitions of aptitudes emerge, extension of a simplified factor-reference battery can progressively simplify analytical techniques of test development. (Author's summary, modified)

5068
Tomsovic, M.
THE EFFECT OF ANOXIA UPON LEARNING AND REVERSAL OF A POSITION HABIT IN THE WHITE RAT. — Ann Arbor: Univ. Microfilms, 1955. Publication no. 10,556. 86 p. 99 ref. DLC

An experiment was conducted to study the effects of anoxia (6 hours at a simulated altitude of 30,000 feet) on the capacity of rats one day after exposure to learn and reverse a position habit in a single T maze with a 23 1/2 hour water deprivation as drive. A statistically insignificant increase in number of trials required for learning and number of errors made was observed in experimental animals. Microscopic examination of the brains of anoxic animals revealed a statistically insignificant decrease in mean cortical cell concentration (lamina II of area 10), but no distinguishing necrosis. Anoxia had no effect on weight change, alterations in the daily water intake, or group running time during the experimental period. Turning preferences prior to training had no effect on learning in experimental or control animals.

5069
Tonndorf, J.,
F. A. Brogan, and D. D. Washburn
AUDITORY DIFFERENCE LIMEN OF INTENSITY IN NORMAL HEARING SUBJECTS. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-31, Aug. 1955. 18 p. AD 90 666 UNCLASSIFIED
Also published in A.M.A. Arch. Otolaryngol., 62 (3): 292-305. Sept. 1955. DLC (RF1.A7, v. 62)

The difference limen (minimum noticeable difference) of sound intensity was investigated in subjects with normal hearing. Averages and ranges of variation were established for various modes of testing, frequency bands, intensity levels, and modulation patterns. There is no change in the difference limen after introduction of masking noise. The difference limen is a continuous function of the sensation level, although it represents a quantal entity. Contrary to a classical concept, loudness is not a direct, but a complex function, of the difference limen.

5070
Tonndorf, J.,
R. W. Hyde, and F. A. Brogan
COMBINED EFFECT OF SOUND AND OXYGEN DEPRIVATION UPON COCHLEAR MICROPHONICS IN GUINEA PIGS. — Annals Otol. Rhinol. and Laryngol., 64 (2): 392-405. June 1955. DLC (RF1.A6, v. 64)
Also issued as: School of Aviation Medicine, Randolph Field, Tex. Report no. 55-32, Sept. 1955. 10 p. AD 94 787 UNCLASSIFIED

Gradient curves of cochlear microphonics were recorded from guinea pigs during and after sound exposure (1000 c.p.s., 130 decibels for 1 minute) and oxygen deprivation (10% or 8% O_2-N_2 mixtures). Moderate anoxia affects cochlear microphonics depending upon the degree of O_2 deprivation and the magnitude of simultaneous exposure to sound. When normal oxygen supply was reintroduced at the termination of sound exposure, the rate of recovery of cochlear microphonics was faster than after sound exposure without return to normal oxygen supply. These findings are taken as evidence that during production of cochlear microphonics and in gross proportion to the magnitude of sound exposure, electrical energy is drained from the cochlea. This indicates that cochlear microphonics, as produced in the organ of Corti, are not mere by-products, but represent the essential link between mechanical stimulation of the cochlea and nervous excitation. (Authors' summary, modified)

5071
Torrance, E. P.,
R. C. Ziller, and M. Levi
PERSONALITY REQUIREMENTS FOR SURVIVAL [Abstract]. — Amer. Psychologist, 10 (8): 502. Aug. 1955. DLC (BF1.A55, v. 10)

A synthesis is presented of a series of seven substudies on personality requirements for survival, actual adaptation by survivors to meet these requirements, and more effective ways of training aircrews to meet these requirements.

5072
Torrance, E. P.
PSYCHOLOGICAL BEHAVIOR IN SURVIVAL. — In: Needed survival research, p. 20-22. Ed. by E. G. Pattishall. George Washington Univ., Washington, D. C. (Contract AF 18(600)-1180). Technical Report, Nov. 1955. DNLM

A discussion is presented of research needs in the psychological aspects of survival. It is suggested that available data on the behavior of U. S. Air Force flying personnel in emergencies and extreme conditions be analyzed and that theoretical concepts derived from the analysis be tested in field studies. Information is needed concerning: (1) conditions leading to panic; (2) techniques of panic control; (3) the will to survive in extended hardship conditions, lone sea survival, evasion or escape in enemy territory, and in solitary confinement; (4) the effects of solitude; (5) techniques to maintain mental balance in solitude, pain, and discomfort; (6) principles of leadership; (7) communication with non-English speaking peoples; and (8) resistance to enemy interrogation and indoctrination.

5073
Tostes, E.
[SURVIVAL AT SEA] Sobrevivência no mar. — Revista médica da aeronáutica (Rio de Janeiro), 7 (1-4), Jan.-Dec. 1955. In Portuguese. DNLM

The methods of survival at sea during peace and in times of war are briefly discussed as related to

protection from the elements and the preparation of water for drinking. Mention is made of the aerial rescue of victims from shipwrecks or aircraft accident, including those of the U. S. Air Force in the Pacific during World War II, and the aeromedical evacuation of patients during the Korean Campaign.

5074
Townsend, G. M.
CREW EFFECTIVENESS IN THE B-52 STRATEGIC BOMBER. III. ANALYSIS OF CREW CAPABILITIES DURING TEST FLIGHTS. — Jour. Aviation Med., 26 (1): 18-19. Feb. 1955.
DLC (RC1050.A36, v. 26)

The author discusses the experimental flight testing of aircraft conducted as standard procedure by the Air Force. Such testing is divided into seven phases: the initial testing by the manufacturer; the first test and check of the contractor's guarantees by the Air Force; design refinement and rectification of any deficiencies revealed by the check; determination of performance and stability; determination of flying and handling characteristics; functional testing of the various airplane systems during flight of sufficient duration to test the durability of the plane and its systems; operational suitability trials with full crew complement under simulated and actual flight and combat conditions. The author cites several examples of inefficiency in design of flight equipment which he believes resulted from inadequate field tests.

5075
Tozer, E.
FOR BETTER PILOTS: TEACH INSTRUMENTS FIRST, CONTACT LATER. — Aviation Age, 24 (5): 186-191. Nov. 1955. DLC (TL501.A8187, v. 24)

In an experimental study by the University of Illinois' Institute of Aviation, student pilots have been successfully trained in instrument flight procedure before learning contact flying. The students obtained their pilot license within the time normally allotted for training in contact flight.

5076
Tozer, E.
TAKING THE GUESSWORK OUT OF PILOT SELECTION. — Aviation Age, 23 (3): 148-153. March 1955. DLC (TL501.A8187, v. 23)

An eight-hour examination, comprising written tests and signal reaction-time tests and a personal interview, is utilized by the American Institute for Research to rate potential business and airline pilots. The critical requirements tested are derived from an analysis and frequency rating of the critical components of the job of piloting.

5077
Traeger, K. A.
RIP CORD FOR EMERGENCY RELEASE OF IMMOBILIZED MANDIBLE. — U. S. Armed Forces Med. Jour., 6 (3): 329-335. March 1955.
DLC (RC970.U7, v. 6)

Nausea and vomiting caused by motion sickness are major problems in the aerial evacuation of casualties, and especially in patients with immobilized jaws. In the event of motion sickness and nausea even trained personnel require a dangerously long period of time to relieve immobilized jaws. Following an evaluation of the time required to remove a few common types of intermaxillary fixation, a new method is described and illustrated. It utilizes a 20-gage hypodermic needle as a "rip cord" in the manner of a cotter key, allows satisfactory fixation and provides the patient with a simple, quick method of removing the fixation when necessary.

5078
THE TRAINING OF AIR FRANCE'S CO-PILOTS. — I. T. A. Bulletin, 1955 (11), article 179/IS. 1 p. March 14, 1955. DLC (TL502.I49)

Air France has introduced the Morane 733 to replace the Stampe bi-plane in its training program for co-pilots. The Morane 733, with features usually found only in twin-engined aircraft, provides more comprehensive training and reduces the flight time required on twin-engined trainers.

5079
TRANSONIC TRAINER. — Flight (London), 67 (2399): 49. Jan. 14, 1955. DLC (TL501.F5, v. 67)

The TF-86 dual-control trainer version of the F-86F fighter is briefly described.

5080
Treadwell, C. R.,
G. V. Vahouny, and D. F. Flick
EFFECTS OF COLD ON CHOLESTEROL FATTY LIVERS [Abstract]. — Federation Proceedings, 14 (1^1): 453. March 1955. DLC (QH301.F37, v. 14)

Young rats fed on a diet supplemented or not with 2% cholesterol were exposed for 21 days to environmental temperatures of 1° or 27° C. Blood cholesterol esters were increased in all cholesterol-fed animals, but the increase was greater in cold-exposed animals. Cold had no lipotropic effect or produced a further increase in total liver lipids in cholesterol-fed animals, with phospholipids and cholesterol esters increased and neutral fat decreased. Cold had preventive and curative lipotropic effects in cholesterol-free rats, causing an increase in phospholipids and decreases in cholesterol esters and neutral fat.

5081
Treadwell, C. R.,
D. F. Flick, and G. V. Vahouny
EFFECT OF COLD ON FAT FATTY LIVERS [Abstract]. — Federation Proceedings, 14 (1^1): 452-453. March 1955. DLC (QH301.F37, v. 14)

Young rats were fed choline and inositol-free diets varying in casein and fat content, for 28 days during exposure to environmental temperatures of 27° or 1° C. With 5 and 10% dietary protein levels and with 10 to 40% fat levels. The growth rate was higher at 1° C. At protein levels of 20-40% the growth rate was higher at 27°. Total liver lipids were highest at 27° on the 5% protein diet, dropping regularly with increases to 30% in dietary protein, and at 1° were essentially the same at all protein levels. Increases in the fat content of the diet from 10 to 40% produced sharp increases in liver lipids at 27° and no significant change at 1°. The results indicate that cold is an effective lipotropic agent.

5082
Tribel
[CONSIDERATIONS OF PROFESSIONAL DEAFNESS

IN PILOTS OF PISTON MOTOR AND JET AIRCRAFT] Considérations sur la surdité professionnelle des pilotes d'avions à moteurs à pistons et des pilotes d'avions à reaction. — Médecine aéronautique (Paris), 10 (4): 367-370; discussion, p. 371-372. 1955. In French. DLC (TL555.M394, v. 10)

Pilots of jet and piston motor aircraft were examined audiometrically to determine differences in hearing loss between the two groups. Three types of hearing curve were distinguished: (1) no hearing loss, (2) hearing loss of 5-10 db. around 4000 c.p.s., and (3) hearing loss of 15 db. or more around 4000 c.p.s. In combined statistics for the two groups of pilots, it was found that the number of curves of types (2) and (3) increased proportionally with age and number of hours of flight. The average results from pilots who had flown both jet and other aircraft yielded a curve distribution similar to that for the total studied. Results obtained from jet pilots selected for age (25-35 years), however, who had flown aircraft a greater total number of hours than the comparable age group of pilots of other aircraft, yielded a percentage distribution of 47% for curve (1), 41% for curve (2), and 12% for curve (3). The distribution among 25-35 year old pilots of piston motor craft only was 24% for curve (1), 37% for curve (2), and 39% for curve (3). Among jet pilots, moreover, the percentage of curves of types (2) and (3) was increased in pilots who had flown mostly piston motor craft. The tendency for greater hearing loss among pilots of piston motor aircraft necessitates a reevaluation of the phenomenon of occupational deafness in pilots.

5083
Trites, D. K.,
A. L. Kubala, and S. B. Sells
AIRCRAFT ACCIDENTS VS. CHARACTERISTICS OF PILOTS. — Jour. Aviation Med., 26 (6): 486-494. Dec. 1955. DLC (RC1050.A36, v. 26)

An accident study was made of 666 aviation cadets and 578 student officers who completed flight training during 1950-1952; a second group was also studied which was composed of 122 cadets and 84 officers; this group was separated from the first because there existed a measure of accident exposure which permitted study of the relationships between pilots and accidents while holding constant the accident risk. The object of the study was to determine the relationship, if any, between the personal characteristics of a pilot and his accident rate. Four measures of individual adjustment to flight training, two measures of flying aptitude, and age were analyzed in relation to accidents and accident exposure in a period of post-training operational flying. The results support the hypothesis that those pilots who have a greater number of accidents than expected on the basis of exposure risk tend to be younger, better adjusted to their jobs and status, and more skillful than pilots who have had fewer accidents. (Authors' summary, modified)

5084
Trites, D. K.,
and S. B. Sells
COMBAT PERFORMANCE: MEASUREMENT AND PREDICTION [Abstract]. — Amer. Psychologist, 10 (8): 455. Aug. 1955. DLC (BF1.A55, v. 10)

The training level data and combat data of 65 Air Force pilots in the Korean theater of operations were evaluated to provide answers to these questions: (a) Are ratings of combat performance and adjustment by peers, superiors, and psychologists related to objective data? (b) Are peer-superior ratings related to psychologist ratings based in part upon the information obtained from peers and superiors? (c) Are combat criteria predictable by the precombat criteria of performance and adjustment? In addition to affirmatively answering the above, the results produced some significant insights into the structure of combat criteria.

5085
Trites, D. K.
PSYCHIATRIC SCREENING OF FLYING PERSONNEL: EVALUATION OF ASSUMPTIONS UNDERLYING INTERPRETATION OF SENTENCE COMPLETION TESTS. — School of Aviation Medicine, Randolph Field, Tex. Report no. 55-33, March 1955. 9 p. AD 75 198 UNCLASSIFIED

An 84-item sentence completion test was used to evaluate two assumptions often made in the objective interpretation of this type of test. These are: (a) incomplete sentence stimulus items whose verbal content and meaning are immediately apparent and generally agreed upon will elicit responses which refer to this "generally agreed upon" meaning; and (b) systems of response classification which represent the attitudes and objects referred to by both stimulus and response may be developed by considering only the verbal content of the stimuli. In other words, it is assumed that responses to the items refer to their common meaning, and that an adequate scoring system based on categories of item meaning can be constructed. A factor analysis of the intercorrelations of 74 of the 88 items yielded partial support for both assumptions. (Author's abstract)

5086
Tupes, E. C.
COMPARISON OF PERFORMANCE IN USAF OFFICER CANDIDATE SCHOOL OF CANDIDATES SELECTED BY TWO SCREENING PROCEDURES. — Air Force Personnel and Training Research Center, Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-16, July 1955. vi+30 p. AD 72 584 PB 120243

A further evaluation of the new selection procedures introduced in 1952 was provided by comparing the performance of 223 male candidates selected by procedures in use before 1952 with the performance of 367 candidates selected by the revised screening procedures. The latter group was found to be older, of higher pre-OCS rank, to have completed fewer years in college, and to include a greater proportion of married candidates. In comparison with the old procedures group, a higher percentage of this group graduated from OCS and a higher percentage of those graduated were distinguished graduates. Failures for military deficiency were of the same proportion for both groups, but the new selection group resulted in significantly fewer failures (only 1.4%) as the result of academic deficiency, whereas 9.4% of the old procedures group failed for this reason. The increased efficiency of the new procedures appears to result from the weight assigned certain objec-

tive measures of past military accomplishment and to the weight assigned officer aptitude and general learning ability as measured by the officer quality score of the Aviation Cadet Qualifying Test. (From the AD abstract)

5087
Tupes, E. C.,
and W. R. Borg
EVALUATION OF A SELECTION COMPOSITE FOR SCREENING APPLICANTS FOR USAF OFFICER CANDIDATE SCHOOL. — Air Force Personnel and Training Research Center, Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-15, July 1955. v+13 p. AD 72 589 PB 118609

The new composite score introduced in 1952 consisted of an officer quality score derived from (1) the Aviation Cadet Qualifying Test (ACQT), (2) a score based on a board interview, and (3) other scores based on years completed of college and of airman technical school, on rank, and on length of service. Scores on the composite and its components were obtained from 360 candidates for officer training. Biserial correlations between these scores and the criterion of graduation were very low. For the 305 graduates, intercorrelations of the composite and its components and academic and military grades were computed, but only 1 of the variables, the ACQT officer quality score, was significantly related to academic grades. Four variables (service, rank, interview positive, and college negative) were significantly related to military grades. None of the components of the OCS selection composite nor the composite itself were related to the criterion of graduation-elimination from OCS, and the composite had little validity for predicting academic or military scores. (From the AD abstract)

5088
Tupes, E. C.,
J. W. Bowles, and D. V. Torr
PREDICTING MOTIVATION FOR FLYING TRAINING AMONG SENIOR AFROTC CADETS. — Air Force Personnel and Training Research Center, Lackland Air Force Base, Tex. Research Report no. AFPTRC-TN-55-18, July 1955. v+8 p. (Project no. 7701). AD 72 428 PB 118610

A battery of aptitude, attitude, and biographical information tests was administered at 6 universities to AFROTC senior cadets on whom AFROTC proficiency criterion measures were obtained. Biserial correlations were computed between each predictor variable and a motivation-for-flying criterion. The criterion was established from cases of students who had actually applied for flying training and those who had not applied but considered themselves able to pass the flight physical examination. Results indicated that (1) research designed to reveal relationships between aptitudes and motivation for flying is unlikely to be fruitful; (2) a significant relationship exists between favorableness of military attitude and motivation for flying; (3) the development of indirect (unfakable) measures of motivation for flying is feasible; (4) items of the type contained in the personal inventory may be valid predictors of motivation for flying; and (5) verbal statements concerning the intention to apply for flying training in the future are not reliable. (AD abstract)

5089
Turner, H. L.,
and G. E. Cooper
AIRCRAFT CANOPY ESCAPE CAPSULE. — U. S. Patent 2,699,305. Jan. 11, 1955. 6 leaves. DP

An escape capsule consisting of a specifically constructed ejection seat and cockpit enclosure has been designed for ejection from high-altitude, high-speed aircraft during flight. The capsule provides survival equipment and protection from accelerative forces, low temperature, and rarefied air.

5090
TWO STAGE TRAINING GIVES STUDENT PILOTS CONFIDENCE. — Canadian Aviation (Toronto), 28 (3): 30-31. March 1955. DLC (TL501.C33, v. 28)

The Chipmunk has been introduced in the RCAF pilot training program to replace the more difficult Harvard as the basic flying trainer. Use of the Chipmunk is expected to inspire student confidence, reduce dropouts, and reduce instructor costs by decreasing the initial dual training time from 22 hours to 8 hours.

5091
Tyler, J.,
and G. Towle
A JET EXHAUST SILENCER. — Noise Control, 1 (4): 37-41, 54. July 1955. DLC (TA365.N6, v. 1)

A ground jet-exhaust silencer is described and illustrated which reduces low-frequency noise and causes the maximum noise to occur at very high audio frequencies. At these high frequencies sound is rapidly absorbed in the atmosphere. It is easily attenuated by means of ear protectors for the maintenance personnel who work on the engine. The noise is also attenuated by air absorption at appreciable distances from the airplane. Application of this method of exhaust silencing to aircraft in flight is considered.

5092
Universal Match Corp.
THE DEVELOPMENT OF A METHOD FOR PREDICTING RESPIRATORY VOLUMES IN MONKEYS. — Armament Division, Universal Match Corporation (Contract DA-18-064-CML-2515). Progress Report no. 13, March 3, 1955. 2+6+12 p. (Project no. 4-11-04-003). AD 91 080 UNCLASSIFIED

Respiratory measurements were made on ten human subjects and two anesthetized chimpanzees by the Guyton, direct, and strain-gage methods. The respiratory volumes obtained by the absolute method on human subjects in a quiet standing position were slightly greater (less than 10%) than the Guyton prediction. No relationship between weight and respiratory volume was observed. Strain-gage calibration for the quiet sitting position was adjusted to 0.01% change in resistance equal to 137.5 ml. of respired air, decreasing the coefficient of variation between direct and strain-gage measurements to an average of 15%. Respiratory volume determined by the respiration totalizer method closely approximated that determined by the manual count method. Previous data indicating a strain-gage calibration of 0.01% change in resistance equal to 75 ml. of respired air for anesthetized chimpanzees were confirmed.

5093
Universal Match Corp.
THE DEVELOPMENT OF A METHOD FOR PREDICTING RESPIRATORY VOLUMES IN MONKEYS. — Armament Division, Universal Match Corporation (Contract DA-18-064-CML-2515). Progress Report no. 14, April 6, 1955. 2+6+14 p. (Project no. 4-11-04-003). AD 91 097 UNCLASSIFIED

Respiratory measurements were made by the Guyton, strain-gage, and absolute methods on 13 human subjects in the quiet standing position and after exercise. The average respiratory volumes obtained by the absolute method correlated closely with those predicted by the Guyton formula. No relationship between weight and respiratory volume was observed. The data obtained under conditions of exercise demonstrate that the strain-gage method can be used to measure respiratory volumes considerably greater than normal.

5094
Universal Match Corp.
THE DEVELOPMENT OF A METHOD FOR PREDICTING RESPIRATORY VOLUMES IN MONKEYS. — Armament Division, Universal Match Corporation (Contract DA-18-064-CML-2515). Progress Report no. 15, May 3, 1955. 2+4+7 p. (Project no. 4-11-04-003). AD 91 078 UNCLASSIFIED

Respiratory measurements were made by the Guyton, strain-gage, and direct methods on ten guinea pigs restrained in a supine position. The average respiratory volume for the group was more than twice that predicted by the Guyton formula. No relationship between weight and respiratory volume was observed. An arbitrarily selected calibration of 0.01% change in resistance equal to 6.8 ml. of respired air yielded strain gage volumes approximately 10% higher than those measured by the direct method. The respiration totalizer proved easily adaptable for use on guinea pigs. (Quoted in part)

5095
(Univ. of Illinois)
HUMAN PERFORMANCE IN INFORMATION TRANSMISSION. III. FLASH RECOGNITION-SCALE READING. — Control Systems Lab., Univ. of Illinois, Urbana (Contract DA 36-039-sc-56695). Report no. R-68, Oct. 1955. 70 p. (Project no. 8-103A). AD 83 017 UNCLASSIFIED

The assimilation of the information in a single glance as a processing activity in information transmission was examined in a series of experiments. The location of a single dot in a subdivided square was found to be independent of exposure time from .001 to .1 seconds. The amount of information transmitted increased by 8-13% with exposure times from 1 second up, reaching a maximum of 2.2 bits. The maximum information transmitted by a single unnumbered dial was 3.6-3.9 bits when blank, and 4.1-4.4 bits with 12-16 alternating black and white sectors. The total information transmitted by the black and white dial was increased to 6.3 bits by the addition of a second dial, but the information per dial was decreased. Information transmission was only slightly increased by the addition of a third or fourth dial. Two or three pointers on a single dial afforded greater information transmission than two or three one-pointer dials. Transmission was increased to 17.6 bits by presenting three symbols in the center of a single dial. Optimum transmission by a single strip scale was obtained by the use of 24 squares grouped in 4 units by color (4.3 bits). It was increased slightly by addition of a second scale, but not by a third. With fewer graduations, addition of strips increased transmission to a limiting value where the increase in total information was gained at a greatly reduced rate (information per scale).

5096 1954
USAF MEDICAL SERVICE. — U.S. Air Force Medical Service Digest, 5 (7): 2-3. July 1954. DLC

A brief history is presented of the U.S.A.F. Medical Service and of the contribution of its first two Surgeons General, Malcolm C. Grow and Harry G. Armstrong.

5097 1954
THE USAF SCHOOL OF AVIATION MEDICINE. — U.S. Air Force Medical Service Digest, 5 (8): 2-23. Aug. 1954. DLC

A comprehensive discussion is presented of the history of the School of Aviation Medicine, its administrative structure, and its functions in the fields of (1) education of medical personnel, (2) allocation of research funds, (3) aviation and space research work in physiology-biophysics, radiobiology, microbiology, pathology, surgery, biometrics, internal medicine, aeromedical evacuation of patients, pharmacology-biochemistry, psychology, preventive medicine, ophthalmology, psychiatry, neurology, ear, nose, and throat medicine, and dentistry, (4) veterinary science, and (5) consultation in aeromedical problems.

5098
USN AIRCRAFT BAILOUTS: APRIL THROUGH JUNE 1955. — U. S. Naval Aero-medical Safety Jour., 1 (3): 21-22. Nov. 1955. DNLM

A brief review of cases of bailout from U. S. Navy aircraft during the period April to June, 1955, is presented. Statistical data are given concerning plane type, altitude, attitude, injury class, wind speed, aircraft speed, and parachute type in cases of ejection during the same period.

5099
USN AIRCRAFT DITCHINGS AND WATER CRASHES: APRIL THROUGH JUNE 1955. — U. S. Naval Aero-medical Safety Jour., 1 (3): 20-21. Nov. 1955. DNLM

Aircraft ditchings and water crashes of U. S. Navy carrier aircraft, helicopters, and multi-engine aircraft during the period April to June, 1955, are briefly described.

5100
USN BAILOUT AND EJECTION DATA. — U. S. Naval Aero-medical Safety Jour., 1 (1): 8-13. 1955. DNLM

Bailout and ejection statistics of the U. S. Navy for the period June through December, 1954, are presented. Information is given concerning plane type, altitude of bailout and of parachute opening, aircraft attitude and speed, injury class, wind speed, and type of parachute used. Medical reports of selected cases of bailout and ejection are presented.

5101
USN PLAN FOR CERTIFICATION IN AVIATION MEDICINE. — Contact (Pensacola), 13 (1): 15-18. 1955. DNLM

The following steps are proposed for certification in aviation medicine by the U. S. Navy: (1) attendance of regular course for flight surgeons at the School of Aviation Medicine, Pensacola, Florida (6 months); (2) continuation of training (2 months in physiology, 2 months of clinical work, 2 months of aviation examining); (3) assignment to normal aviation medical billet (24 months); and (4) residency training in aviation medicine (24 months) with clinical, general, or research emphasis.

5102
U. S. Office of Naval Operations
[SURVIVAL IN DIFFICULT CONDITIONS] Survivre dans des conditions difficiles. 187 p. illus. Léopoldville: Edition du "Bulletin militaire", 1955. DLC (TL553.7.U415)

Translation of: How to Survive on Land and Sea. — xiii+264 p. illus. Annapolis: United States Naval Institute, 1943. DLC (TL553.7.U4)

A manual intended particularly for airmen, offering comprehensive instruction in the techniques of survival on land and sea, in the Arctic, and in the Tropics. Techniques of orientation, traveling, cooking, and finding drinking water, food, and shelter, are described. The hazards of sun, snow, heat, disease, animals, and plants, are also considered.

5103
Vacca, C.,
V. Guida, and L. Fazioli
[EFFECTS OF HESPERIDIN METHYLCHALCONE ON THE OSMOTIC RESISTANCE OF ERYTHROCYTES AND ON THE SURFACE TENSION IN VITRO, IN VIVO, AND IN HYPOXIC CONDITIONS] Effetti "in vitro" ed "in vivo" ed in condizioni di ipossia del metilcalcone di esperidina sulla resistenza osmotica delle emazie e sulla tensione superficiale. — Rivista di medicina aeronautica (Roma), 18 (4): 840-856. Oct.-Dec. 1955. In Italian with English summary (p. 853). DLC (TL555.A1R5, v. 18)

Hesperidin was found to exert a protective effect on the osmotic resistance of erythrocytes to hemolysis after the administration of 5 mg./kg. daily for 7 days in both man and animals (dogs, rabbits, guinea pigs, rats). The same effect was noted during acute hypoxia induced by exposure to a simulated altitude of 5000 meters in a decompression chamber for half an hour. Hesperidin was also found to decrease surface tension (decreased the surface tension of distilled water or physiological saline solution by 11 dynes/cm^{-1} and by 4 dynes/cm^{-1} more when serum was added to these solutions). A possible explanation of the protective action of hesperidin on the cellular membrane is that the remarkable decrease in surface tension permits hesperidin to penetrate the cellular membrane, thus increasing its resistance to osmotic phenomena.

5104
Vacca, C.,
and E. Boeri
[VARIATIONS IN THE ACTIVITY OF MUSCULAR LACTIC DEHYDROGENASE IN RATS SUBJECTED TO PROLONGED HYPOXIA] Variations de l'activité de la déshydrogénase lactique musculaire chez le rat soumis à l'hypoxie prolongée. — Médecine aéronautique (Paris), 10 (1): 47-49. 1955. In French. DLC (TL555.M394, v. 10)

Same as item no. 3577, vol. III.

5105
Vaeth, J. G.
200 MILES UP: THE CONQUEST OF THE UPPER ATMOSPHERE. — 2nd ed. xiii+261 p. New York: Ronald Press Co., 1955. DLC (QC879.V3, 1955)

This book gives an account of the American program for upper air research and includes the following chapters: (1) the upper atmosphere—a frontier of scientific exploration; (2) the atmospheric ocean; (3) upper air research instruments; (4) vehicles for upper air research; (5) project skyhook--upper air research by balloon; (6) the White Sands Proving Ground; (7) principles of rocket flight; (8) the V-2—inaugurator of modern high altitude rocketry; (9) the high-flying aerobee; (10) the Viking; (11) the future and the upper air; (12) the minimum satellites, and (13) beyond the earth.

5106
Vaksleiger, G. A.
[A METHOD FOR THE DETERMINATION OF RESPIRATORY CENTER STIMULABILITY] K metodike opredeleniia vozbudimosti dykhatel'nogo tsentra. — Fiziologicheskii zhurnal SSSR (Moskva, Leningrad), 41 (3): 428-430. May-June 1955. In Russian. DLC (QP1.F57, v. 41)

Stimulability of the respiratory center can be established by way of determining the threshold of cough reaction or by way of measuring the threshold of neuro-symptoms or nerve manisfestations related to changes in respiratory movements. Following the administration of morphine or of narcotic drugs the thresholds of vagus nerve stimulability rose to considerably higher levels, and following the administration of large doses the cough reaction became completely obliterated; in place of cough stimulation the vagus nerve elicited arrest of the respiratory center activity. By the described method it was possible to make repeated determinations of the state of respiratory center stimulability on the same animal during normal states of the nervous system or during nervous system states constituting shifts from the normal.

5107
Valle-Jiménez, A.
[HISTOPHYSIOLOGICAL STUDIES OF THE RETICULO-ENDOTHELIAL SYSTEM IN RELATION TO CHANGING BAROMETRIC PRESSURE] Histophysiologische Studien des retikulär-endothelialen systems mit Bezug auf wechselnden atmosphärischen Druck. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 205-209. 1955. In German, with English summary (p. 209). DLC (TL503.W5563, v. 1954)

Experimental investigations were carried out with rabbits on the effects of daily exposure to 6500 m. simulated altitude on the reticulo-endothelial system. Altitude sickness stimulates the reticulo-endothelial system to increased antigen activity. Particularly, the colloidopexy exceeds the normal level after the 25th day by more than 100%. There is hyperplasia of the constituent elements and an increase in the active cellular surface. This results in heightened resistance to

virus infections during the first months of acclimatization to altitude.

5108
Van Liere, E. J.
and E. J. Fedor
CARDIAC AND ADRENAL HYPERTROPHY IN ALBINO RATS FOLLOWING ACCLIMATIZATION TO ALTITUDE. — Proc. Soc. Exper. Biol. and Med., 88 (4): 676. April 1955. DLC (QP1.S8, v. 88)

Rats subjected to intermittent hypoxia (80 mm. Hg for 4 hours daily for 41 days) exhibited marked cardiac and adrenal hypertrophy.

5109
Vaughan, B. E.,
and N. Pace
MYOGLOBIN CONTENT OF RATS AT SEA LEVEL AND CHRONICALLY EXPOSED TO HYPOXIA. — Federation Proceedings, 14 (1I): 155-156. March 1955. DLC (QH301.F37, v. 14)

Methods were developed for the differential spectrophotometric determination of myoglobin in the heart, diaphragm, and other myoglobin-containing tissues of rats. An increase in total body myoglobin content and myoglobin concentration in all muscle groups was observed in rats born and reared or maintained for 2-3 months at an altitude of 12,500 feet.

5110
Vavala, D. A. 1954
THE BIOPHYSICAL AND PATHOLOGICAL EFFECTS OF EXPLOSIVE DECOMPRESSION. — School of Aviation Medicine, Randolph Field, Tex. Unnumbered report, June 1954. 28 p. UNCLASSIFIED

A comprehensive review and study of experimental and clinical data on explosive decompression is presented, including its physiological considerations and effects, and the pathological effects such as pulmonary interstitial emphysema, aeroembolism, mediastinal emphysema, and pneumothorax. Graphs, tables, photographs, X-rays, and case histories are also presented.

5111
Vavala, D. A.
THE BLOOD TRANSPORT OF RESPIRATORY GASES. THE EFFECTS OF ALTITUDE HYPOXIA AND HYPERVENTILATION ASSOCIATED WITH POSITIVE PRESSURE BREATHING. — Military Med., 117 (6): 513-521. Dec. 1955. DLC (RD1.A7, v. 117)

A discussion is presented on respiratory and circulatory function at ground level and at altitude, as affected by hypoxia and hyperventilation associated with positive-pressure breathing. Oxygen dispensing systems have not eliminated the hypoxia problem; positive-pressure breathing cannot be carried out effectively above 50,000 feet because the magnitude of the positive-pressure required to keep the blood in a normal or quasi normal state of oxygen saturation, among other things, causes pooling of the blood in dependent parts of the body (stagnant hypoxia). It is suggested that knowledge of normal blood transport of respiratory gases and of the effects of altitude hypoxia and hyperventilation associated with positive-pressure breathing may be invaluable in preventing, recognizing, or treating these conditions at altitude.

5112
Vavala, D. A.
THE PRESENT STATUS OF AEROEMBOLISM. — Jour. Aviation Med., 26 (3): 230-239. June 1955. DLC (RC1050.A36, v. 26)

This is a review of the present knowledge concerning decompression sickness. The author states that the term "dysbarism" has been adopted at the School of Aviation Medicine to represent the entire symptom complex of the effects of reduced barometric pressure on the body. The formation of gas bubbles (chiefly nitrogen) within the body due to a decrease in the ambient atmospheric pressure is the cause of decompression sickness. It is believed that the bubbles are formed in the tissues outside the blood vessels, and that the pain of bends is due to the distortion of nerve endings by these bubbles. The principal symptoms of dysbarism are chokes (a respiratory manifestation), dermal, and neurologic symptoms. Denitrogenation by preoxygenation before a flight provides a high degree of protection against the onset of dysbarism. Physical activity at altitude increases the incidence of bends, and should be limited; premedication has no effect on the prevention of decompression sickness.

5113
Véghelyi, P.,
and L. Harsing
[RENAL FUNCTION IN HYPOTHERMIA] Nierenfunktion in Hypothermie. — Klinische Wochenschrift (Berlin), 33 (37/38): 908-909. Oct. 1, 1955. In German. DNLM

Dogs rendered hypothermic (24-29° C.) by immersion showed a decrease of 20-40% in blood minute volume, a decrease of 20-25 mm. Hg in blood pressure, a decrease of 50-70% in renal blood flow, and a similar decrease in glomerular filtration rate. Little change from normothermic values was noted above a body temperature of 29° C. Diuresis and the excretion of electrolytes remained largely unchanged during hypothermia.

5114
Vendramini, E.
[DAMAGE TO THE HUMAN ORGANISM CAUSED BY NOISE] Danni del rumore sull'organismo umano. — Audiotecnica (Torino), 3 (1-4): 165-176. Jan.-Dec. 1955. In Italian. DLC (TA365.A8, v. 3)

A review is presented of the effects of noise, including aircraft noise ranging from 115-140 decibles, on the human body. Damage occurs primarily in the: (1) ear (hearing disorders, occupational deafness); (2) psychic and cerebral activity (depression, anxiety); (3) physical and mental activity (reduction in mental and work capacity), and to (4) various organs and systems (autonomic nervous, respiratory, and circulatory systems and related motor functions).

5115
Veneklasen, P. S.
METHODS OF NOISE CONTROL—PERSONAL PROTECTION. — Noise Control, 1 (5): 29-33, 79. Sept. 1955. DLC (TA365.N6, v. 1)

A discussion is presented on the general design requirements and possibilities of personal ear defenders against high-intensity industrial noises. Modern methods use ear plugs, ear muffs, and helmets separately or in combination. Limitations

of the defenders are determined by both human physiology and hearing, improper and uncomfortable fit, and possible toxicity from the material of the defender. Noise attenuation achieved by various protective devices is analyzed graphically.

5116
Venrath, H.,
H. Lechtenbörger, H. Valentin, and W. Bolt
[THE BEHAVIOR OF RESPIRATION AND CIRCULATION IN UNILATERAL AND BILATERAL LOW OXYGEN BREATHING: A CONTRIBUTION ON THE COMPENSATION OF ACUTE HYPOXIA BY CIRCULATORY ADAPTATION] Das Verhalten von Atmung und Kreislauf bei uni- und bilateraler Sauerstoffmangelatmung: ein Beitrag zur Kompensation akuter Hypoxie durch Kreislaufstellung. — Zeitschrift fur Kreislaufforschung (Darmstadt), 44 (13/14): 544-555. July 1955. In German. DNLM

An experiment was conducted to determine the relative effects of acute and partial hypoxia produced by spirometric rebreathing in one or both lungs on the heart minute volume and blood oxygen content of narcotized dogs. Increases in respiratory rate at an arterial O_2 saturation level of 90% and in heart minute volume at an average saturation of 83% failed to compensate for the decline of blood O_2 saturation produced by acute hypoxia. In partially hypoxic dogs, blood O_2 saturation was maintained at a normal level by the compensatory increase of heart minute volume induced by the initially declining O_2 saturation level, and by vasoconstriction in the hypoxic lung. It is suggested that the possibility of masking in cases of partial hypoxia may be avoided by an examination of circulatory activity.

5117
VERTIGO. — U. S. Naval Aero-medical Safety Jour., 1 (1): 14. 1955. DNLM

A report is presented of the crash of an aircraft whose pilot apparently experienced momentary vertigo during an instrument approach by flying over the brightly lighted landing field into darkness.

5118 1954
VETERINARY SERVICE. — U. S. Air Force Medical Service Digest, 5 (7): 25-27. July 1954. DLC

The training program of the Air Force Veterinary Service and its functions in the fields of food inspection, medical care for animals, control of animal diseases communicable to man, research, and preventive medicine are discussed.

5119
Vidal-Madjar, M. D.
[SOME CAUSES OF ACCIDENTS IN TOURIST FLIGHTS] De quelques causes d'accident en aviation de tourisme. — Archives des maladies professionnelles de médecine du travail et de sécurité sociale (Paris), 16 (6): 580-584. 1955. In French. DNLM

Based on an analytical study of aircraft accidents it is noted that: (1) 50% of all accidents, and especially the majority of fatal ones, are due to nonadherence to rules and regulations by the pilot or to acts characterized by the lack of discipline; (2) 10%, constituting more than 15% of all fatal accidents, are caused by pilot errors, and (3) about 26% are attributed to faulty equipment. In order to prevent accidents it is suggested that: a stricter psychophysiological examination be given to pilot candidates; more rigid disciplinary measures be enforced with penalties imposed for infractions; persons seeking adventure be eliminated during flight training, and that pilots be prohibited from using tobacco, alcohol, and certain drugs and foods prior to flight duty.

5120
Vikhliaev, IU. I.,
and N. I. Ulovich
[EFFECT OF ANESTHETICS ON THE SURVIVAL OF MICE IN ANOXIA] Vliianie narkoticheskikh veshchestv na vyzhivaenost' myshei pri kislorodnom golodanii. — Farmakologiia i toksikologiia (Moskva), 18 (5): 27-29. Sept.-Oct. 1955. In Russian. DLC (RS1.F25, v. 18)

Urethane, sodium amytal, and codeine affected differently the survival time of mice subjected to light and severe anoxia caused by the introduction of nitrogen oxide. Administration of the narcotic substances prolonged the life of the mice in severe anoxia: in light anoxia, it increased the mortality rate, the extent of increase differing with the anesthetic used, urethane being the gravest offender and sodium amytal the lightest.

5121
Violette
[GASEOUS FLOW DURING EXPLOSIVE DECOMPRESSION. PHYSIOLOGICAL AND AERONAUTICAL CONSEQUENCES] L'écoulement gazeux au cours des décompressions explosives. Conséquences physiologiques et aéronautiques. — Technique et science aéronautiques (Paris), 4955 (4): 223-229. 1955. In French. DLC (TL502.E3614, v. 1955)

The data presented in this paper are also included in the report, item no. 5122.

5122
Violette, F.
[EXPERIMENTAL AND THEORETICAL STUDY OF EXPLOSIVE DECOMPRESSION AND ITS PHYSIOLOGICAL EFFECTS] Étude expérimentale et théorique de la décompression explosive et de ses effets physiologiques. — Ministère de l'Air (France), Bulletins des Services techniques, no. 118, Nov. 1955. 2+3+106 p. In French. DNLM
Excerpts issued as: [STUDIES ON PULMONARY PRESSURE DURING EXPLOSIVE DECOMPRESSION] Recherches sur la pression pulmonaire au cours des décompressions explosives. — Comptes rendus de l'Académie des sciences (Paris), 241 (24): 1855-1857. Dec 14, 1955. In French. DLC (Q46.A14, v. 241)

A mathematical characterization of explosive lung decompression was made on the basis of experimental studies of changes in intrapulmonary pressure during rapid chamber decompressions. The decompression of the chamber and lung was observed to conform to a formula which is dependent on the duration of decompression, total change in pressure, and the ratio of area of the orifice of gaseous escape to volume of the container (flow coefficient). The essential difference between lung and chamber decompression is the difference between the flow coefficients for the two containers. To avoid an overpressure in the lungs during explosive aircraft decompression, the cabin coefficient of air flow must be lower than the glottis co-

efficient of 1/100 m.^{2}/m.^{3}, or with a security factor of 100%, 1/200 m.^{2}/m.^{3}. Decompressions with a coefficient of air flow below this value and with a ratio of initial pressure to final pressure below 2.3 are not considered dangerous. The physiological effects of explosive decompression are attributed to the transient increase in intrapulmonary and intravascular pressure which occurs when the chest position is static during the first 7.5 milliseconds after the beginning of cabin decompression. (89 references)

5123
Violette, E.
[THE LAW OF PULMONARY DECOMPRESSION DURING EXPLOSIVE DECOMPRESSION] La loi de décompression pulmonaire au cours des décompressions explosives. — Jour. de Physiologie (Paris), 47 (1): 299-303. 1955. In French.
DLC (QP1.J7, v. 47)

The data presented in this paper are included in the report, item no. 5122.

5124
Voas, R. B.
THE EFFECT OF NON-SCORED ITEMS AND RETESTING ON THE TAYLOR MANIFEST ANXIETY SCALE. — In: Research notes from the Aviation Psychol. Lab., p. 41-45. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 108 100.10, March 15, 1955. AD 74 676
UNCLASSIFIED

The 50-item short form of the Taylor manifest anxiety scale and the Minnesota Multiphasic Personality Inventory (with the Taylor scale embedded in 516 unscored items) were administered to six classes of naval aviation cadets in varying order, in sequence or at a 20 hour interval, to investigate the role of fatigue and repetition of items in the difference observed by Taylor in mean scores obtained from the two forms of the test. It was found that the mean score on the anxiety scale was significantly reduced upon second administration regardless of the form used. No significant difference was observed in mean scores on the two forms when forms administered first were compared. The findings of Taylor, and McCreary and Bendig's explanation of Taylor's results in terms of fatigue, are not supported by the results of the study.

5125
Voas, R. B.,
J. T. Bair, and R. K. Ambler
THE RELATIONSHIP BETWEEN BEHAVIOR IN A STRESS SITUATION AND LATER SEPARATION FROM FLIGHT TRAINING WITH EXPRESSED ANXIETY TOWARD FLYING. — Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 101 108.01, June 8, 1955. iii+9 p. AD 77 747
UNCLASSIFIED

The purpose of this research was to determine the relationship between behavior in a miniature stress situation and manifest fear in flight training. Reactions of cadets during simulated high altitude in a decompression chamber were related to later anxiety toward flying as reported in interviews with cadets withdrawing from naval air training. The results indicated that significantly more of the cadets who withdrew because of anxiety toward flying had revealed anxiety reactions in the decompression chamber than did successful cadets. The use of miniature stress situations as predictors and criteria is discussed. (Authors' abstract)

5126
Voĭtkevich, V. I.
[EFFECT OF MUSCULAR STRESS ON ARTERIAL BLOOD OXYGEN SATURATION UNDER NORMAL AND HYPOXIC CONDITIONS] Vliîanie myshechnoĭ nagruzki na nasyshchenie arterial'noĭ krovi kislorodom v normal'nykh i gipoksicheskikh usloviîakh. — Fiziologicheskiĭ zhurnal SSSR (Moskva), 41 (2): 219-226. March-April 1955. In Russian.
DLC (QP1.F57, v. 41)

No lowering of the arterial oxygen saturation was observed in man following light muscular exercise, but intense exercise resulted in hypoxemia the degree of which varied with the individual. The rate of reoxygenation of the blood also varied with the individual. Inhalation of oxygen during intensive muscular exertion counteracted the development of arterial hypoxia, but inhalation of oxygen-poor air induced hypoxia even during light muscular exertion. The ability of the organism to counteract the development of hypoxia during muscular exercise, especially under conditions of low oxygen tension, depended upon the rate at which the organism compensated for the high oxygen consumption by appropriate adjustments in respiration and blood circulation. In this respect physical training played a prominent role.

5127
[MEDICAL PROBLEMS IN INTERPLANETARY FLIGHT: A COLLECTION OF TRANSLATION DIGESTS OF FOREIGN PERIODICAL LITERATURE] Voprosy meditsiny pri mezhplanetnykh poletakh: sbornik sokrashchennykh perevodov inostrannoĭ periodicheskoĭ literatury. — Ed. by V. I. IAzdovskiĭ. 161 p. Moskva: Izd. Inostrannoĭ Lit., 1955. In Russian.
DLC (RC1062.I2)

The book contains digests of 22 papers on aviation medicine, 17 of which had appeared in American journals (Jour. Aviation Med., Scientific American), 4 in a British journal (Jour. Brit. Interplanetary Soc.), and 1 in a French journal (Revue de pathologie générale et comparée). The appended bibliography lists 130 foreign (non-Soviet Union) references, with the titles in Russian translation.

5128
Voss, J. F.
EFFECT OF TARGET BRIGHTNESS AND TARGET SPEED UPON TRACKING PROFICIENCY. — Jour. Exper. Psychol., 49 (4): 237-243. April 1955.
DLC (BF1.J6, v. 49)

Six groups of 16 subjects practiced for five sessions at one of six levels of target brightness. One half of each group practiced at one of two speeds. Two terminal transfer trials were given with the brightest target. Acquisition scores fall into three brackets. The two groups practicing at the two brightest targets do not differ significantly from each other. The group practicing at the third highest brightness differs significantly from all other groups. The groups practicing at the three lowest brightnesses do not differ significantly from each other. As target brightness increases, tracking proficiency increases in a curvilinear manner. There is a significant difference between speeds in

favor of the slower speed, and the brightness speed interaction is significant. The transfer trials indicate that practice at the lowest brightness level is ineffective compared to practice at the higher brightness values used. (Author's summary, modified)

5129
Vozza, R.
[CRITICAL FUSION FREQUENCY AS TEST OF OPERATIONAL FATIGUE IN JET PILOTS] La frequenza critica di fusione come test di fatica operazionale nei piloti di aviogetto. — Rivista di medicina aeronautica (Roma), 18 (3): 771-779. July-Sept. 1955. In Italian, with English summary (p. 777). DLC (TL555.A1R5, v. 18)

Critical flicker fusion frequency was measured immediately before and after flight in 33 pilots of jet planes (F84 Thunderjets) utilizing a stroboscopic apparatus. Four points were fixed at 0°-10°-20°-30° on the meridian 0°-180° of the nasal side. A marked decrease in the critical flicker fusion frequency was exhibited by pilots following flight. Two out of the four points, 0° and 10°, were statistically significant. Various emotional stimuli, accelerations, physical fatigue, and anoxia are considered in the etiology of the ocular manifestations of pilot fatigue. G force appears to be the primary cause of visual ischemia observed during flight.

5130
Wada, S.
AN ESSAY ON CONCEPT AND ESSENTIALS OF ACCLIMATIZATION. — Anales de la Facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Peru), 38 (1): 31-34. 1955. In English. DNLM

A definition of altitude acclimatization in both the broad and the narrow sense is presented, and the concept of acclimatization is briefly analyzed with special reference to the problems of reproduction race, and culture.

5131
WADC TESTS SUPERSONIC BAILOUT CAPSULE. — Amer. Aviation, 19 (15): 33-35. Dec. 19, 1955. DLC (TL501.A675, v. 19)

The Air Force's Wright Air Development Center has developed an ejection capsule for escape from aircraft at supersonic speeds. Rotation of the pilot into a supine position, sealing of the capsule, ejection, deceleration to 190 m.p.h., and lowering to the ground will be accomplished automatically.

5132
Waggoner, J. N.,
and M. L. Pernell
A NEW METHOD FOR BLOOD CARBON MONOXIDE DETERMINATIONS. — U. S. Armed Forces Med. Jour., 6 (1): 121-124. Jan. 1955. DLC (RC970.U7, v. 6)

A new method is described for performing blood carbon monoxide determinations simply, inexpensively, rapidly, and with a reasonable degree of accuracy. The equipment consists of a gas collecting flask, glass adapter, stopcocks, and rubber tubing. The reagents used are saponin, potassium ferricyanide, lactic acid, and caprylic alcohol.

5133
Wang, S. C., 1954
and R. L. Tyson
CENTRAL NERVOUS PATHWAYS OF EXPERIMENTAL MOTION SICKNESS. — Internat. Record Med., 167 (12): 641-650. Dec. 1954. DLC (R11.M745, v. 167)

A review is presented of the experimental studies concerned with the central nervous pathways of motion sickness. The vomiting center has been located in the dorsolateral reticular formation of the brain stem. Afferents to the vomiting center include the vagi, sympathetics, chemoreceptive emetic trigger zone, cerebellum, and labyrinth. The antiemetic potency of chlorpromazine, Dramamine, and Benadryl is noted.

5134
Warrick, M. J.
EFFECT OF EXPONENTIAL TYPE CONTROL LAGS ON THE SPEED AND ACCURACY OF POSITIONING A VISUAL INDICATOR. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-348, June 1955. iii+12 p. (Project no. 7182). AD 99 520 PB 121359

There is inherent in many controller systems a lag between the time that the operator positions his control and the time that the corresponding effect is achieved. Very frequently this lag approximates an exponential function. The present investigation was conducted to determine what effect, if any, such controller system lags have on the human operator's ability to position a visual indicator rapidly and accurately. Each of 20 subjects repeatedly set a pointer to a fixed reference position by means of a rotatable control knob. Exponential lags of 0, 40, 120, 360, and 1000 milliseconds were introduced between the control and the display. It is concluded that any amount of exponential lag reduces the speed and accuracy of setting the pointer. The longer the lag the more pronounced is the effect. However, it appears that the human operator does modify his behavior somewhat so as to compensate to a limited extent for an increased lag. (Author's abstract)

5135
Watts, A. F. A.,
and H. C. Wiltshire
INVESTIGATION OF EYE MOVEMENTS OF AN AIRCRAFT PILOT UNDER BLIND APPROACH CONDITIONS. College of Aeronautics, Cranfield (Gt. Brit.). Note no. 26, May 1955. 23 p. AD 218 400 UNCLASSIFIED

Eye movement patterns were obtained of a pilot in an aircraft fitted with a standard RAF blind flying panel on several approaches under Standard Beam Approach conditions. These patterns were obtained by photographing the reflection of the pilot's eyes in a mirror attached to the instrument panel. The results show the (1) proportion of time spent on each instrument; (3) duration of the fixation time on each instrument; (3) frequency of the eye fixations; and (4) sequence of eye movements. (Authors' summary)

5136
Webb, W. B.
AN ANALYSIS OF THE RELIABILITY AND VALIDITY OF "VOTING BEHAVIOR" COMPARED WITH

INDIVIDUAL JUDGMENTS. — In: Research notes from the Aviation Psychol. Lab., p. 54-57. Naval School of Aviation Medicine, Pensacola, Fla. Research Report no. NM 001 109 101.05, March 15, 1955. UNCLASSIFIED

The contents of this report are essentially identical with those of item no. 5138 although both title and wording of the text are different.

5137
Webb, W. B.
THE PROBLEM OF OBTAINING NEGATIVE NOMINATIONS IN PEER RATINGS. — Personnel Psychol., 8 (1): 61-63. Spring 1955.
DLC (HF5549.A2P53, v. 8)

Essentially the same as the report, item no. 3612, vol. III.

5138
Webb, W. B.
SELF-EVALUATIONS, GROUP EVALUATIONS, AND OBJECTIVE MEASURES. — Jour. Consulting Psychol., 19 (3): 210-212. June 1955.
DLC (BF1.J575, v. 19)

Four groups of Naval Aviation cadets rated each other and themselves on a number of traits including intelligence after being together for 4 weeks and again after they had been together for 15 weeks. At the completion of ratings the Otis Mental Abilities Test was administered. Interrelationships between these measures and ratings obtained after 4 and 15 weeks were computed. The averaged group ratings correlated substantially with the objective measures of intelligence. On the other hand, the individual ratings and self-ratings were highly unreliable and showed only a limited relation to intelligence. In spite of limitations inherent in this study, two empirical facts stand out: (1) a group of peers can fairly well rate its members on intelligence, and (2) an individual's single statement about his intelligence is unrealistic.

5139
Webb, W. B.
STUDENT-CENTERED INSTRUCTION IN A PRE-FLIGHT COURSE. — Naval School of Aviation Medicine, Naval Air Station, Fla. Special Report no. 55-17, Oct. 31, 1955. ii+7 p. AD 78 180
UNCLASSIFIED

An experiment was conducted to determine the effect of elimination of the instructor on performance in an 18-hour lecture course (Principles of Flight) given at the Pre-Flight School of the Naval Air Training Command. Class periods were devoted to study of a textbook, work sheets, and student discussion. The instructor was made available for 5-10 minutes at the end of the period to answer questions. Class grades obtained on regular examinations were found to conform to predictions made from grades obtained in two other courses (regularly taught) and from Aviation Qualification Test scores. One-third to four-fifths of the experimental students were opposed to the procedure.

5140
Webster, J. C.
EAR DEFENDERS: MEASUREMENT METHODS AND COMPARATIVE RESULTS. — Noise Control, 1 (5): 34-42. July 1955. DLC (TA365.N6, v. 1)

Outlined are psychological, psychophysiological and physical methods for measuring the capabilities of ear defenders (plugs, muffs, and helmets, used alone or in combination). Ear defenders offer positive protection against loud noise, provided they have sufficient attenuation and fit the wearer correctly. Noise attenuation achieved by various ear defenders is analyzed graphically.

5141
Webster, J. C.,
and L. Sharpe
IMPROVEMENTS IN MESSAGE RECEPTION RESULTING FROM "SEQUENCING" COMPETING MESSAGES. — Jour. Acoust. Soc. Amer., 27 (6): 1194-1198. Nov. 1955. DLC (QC221.A4, v. 27)

The ability of 10 subjects to repeat relevant information from competing messages directed to four stations over four channels was tested. Three hundred seventy-eight messages were presented in one half-hour session. Muting of irrelevant messages and control of sequence of presentation were allowed for three of the four channels. Only a slight increase in errors and time of performance was noted when the number of stations covered was increased from one to two or three. Forty-three of the errors were recorded in messages coming from the uncontrolled channel.

5142
Wegner, N.,
and D. Zeaman
STRENGTH OF CARDIAC CR'S WITH VARYING UNCONDITIONED STIMULUS DURATIONS. — Univ. of Connecticut, Storrs (Contract Nonr-631(00)). Technical Report no. 15, Aug. 1955. 8 p. AD 75 437
UNCLASSIFIED

The effect of the duration of a shock unconditioned stimulus on the form of a preconditioned heart-rate response was studied. Unpleasant unconditioned stimulus shocks (electric current applied to two fingers of one hand) of 0.1, 2.0, 6.0, and 15 sec. duration were applied to subjects after presentation of a conditioned stimulus tone. It was found that the maximum conditioned heart response did not vary as a function of unconditioned stimulus duration. The results contradicted N. E. Miller's statement that the magnitude of a fear response is dependent on the duration of a noxious stimulus.

5143
Weil, R.
[ON THE EFFECT OF HIGH ALTITUDE ON CHICKEN MALARIA INDUCED BY BLOOD INOCULATION WITH PLASMODIUM GALLINACEUM BRUMPT] Zur Frage des Einflusses des Höhenklimas auf Hühnermalaria bei Blutinokulation mit Plasmodium gallinaceum Brumpt. — Acta tropica (Basel), 12 (1): 53-66. 1955. In German, with English summary (p. 64-65).
DLC (Q3.A25, v. 12)

The course of malarial infection after blood inoculation with Plasmodium gallinaceum was studied in initially 21-day-old chicks at an altitude of 280 m. (control) or after 14 days acclimatization at a high altitude (3457 m.). The course of infection was observed to be qualitatively similar in both groups. The formation of erythrocytic or exoerythrocytic stages occurred in both groups at essentially the same time. Chicks maintained at a high altitude exhibited a milder infection; this is attributed, however, to differences in the virulence

of the strain. It is concluded that the course of an infection induced after altitude acclimatization is not influenced by the modifications of the blood occurring during adaptation.

5144
Weiner, M.
EFFECTS OF TRAINING IN SPACE ORIENTATION ON PERCEPTION OF THE UPRIGHT. — Jour. Exper. Psychol., 49 (5): 367-373. May 1955. DLC (BF1.J6, v. 49)

An attempt was made to determine the effects of training in utilization of postural experiences on the perception of upright. All subjects were pretested in a dark room while seated in a padded chair tilted in various positions. Two tests were given: (1) adjusting a luminous cube to the true upright, and (2) adjusting a luminous rod within the cube to the true upright. Subsequently the experimental group received an hour's specialized training in space orientation, employing various positions of body tilt with the instructions emphasizing differential bodily sensations. Although both the control and the experimental groups showed significant improvement upon retest with the cube test, the latter showed significantly more improvement. The effects of training were transferred to Rod-in-Cube test, as shown by improvement in the experimental group and no improvement in the control group. There were marked individual differences. Improvement was concomitant with increased stability of the visual field and represented a real change in perceptions.

5145
Weiss, A. K.,
and W. G. Moss
EFFECTS OF COLD-EXPOSURE ON LIVER OXYGEN CONSUMPTION OF SUBTOTALLY HEPATECTOMIZED RATS. — Federation Proceedings, 14 (1^{I}): 161. March 1955. DLC (QH301.F37, v. 14)

Oxygen uptake in slices of liver from rats was increased 15% over untreated control values by partial hepatectomy, 25% by exposure to 5° C. for 5 days, and 30% by partial hepatectomy followed by cold exposure. The increased metabolic rate of the liver is attributed to cell division and growth in hepatectomized animals, and to a shift in the balance of hormones of the thyroid-pituitary-adrenal system in cold-exposed animals.

5146
Weiss, B.
BUILDING "FEEL" INTO CONTROL. II. PRESSURE FEEDBACK, SHORT MOVEMENTS, AND THE INFLUENCE OF MIXED VERSUS CONSTANT SERIES OF DISPLACEMENTS. — Univ. of Rochester, New York (Contract N6onr-241, T.O. 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-25, Aug. 1, 1955. 6 p. AD 109 356 UNCLASSIFIED

Experiments aimed at determining the effects of pressure changes and the amount of movement on an operator's ability to control a display by means of an aircraft-type stick control were continued. The effect of varying pressure cues on control displacements of small magnitudes (less than 7.5°) was studied. Four different pressure ranges were used, each with a maximum displacement of 6°; the values were 0, 0 to 7.5, 0 to 15, and 0 to 30 lb. Pressure and distance were linearly related. Four displacements were used in each direction (push and pull) corresponding to 25, 50, 75, and 100% of the maximum distance. The effects of pressure variation were negligible, both on accuracy and on variability of performance. Most of the errors at small magnitudes could be attributed to the operation of a range effect. (AD abstract)

5147
Weiss, B.,
P. D. Coleman, and R. F. Green
TIME-ORDERED EFFECTS IN LONG SERIES OF KNOB CONTROL ADJUSTMENTS. — Univ. of Rochester, New York (Contract N6onr-241, T.O. 6); issued by Office of Naval Research. Special Devices Center, Port Washington, L. I., New York. Technical Report no. SPECDEVCEN 241-6-19, Aug. 1, 1955. 5 p. (SPECDEVCEN Project no. 20-M-1d). AD 109 351 UNCLASSIFIED

Certain kinds of military and industrial equipment, such as range finders, require the operator to perform long series of control settings. Since successive settings are not independent, it is useful to know the relationship between what an operator does on a particular setting and the one or more preceding settings. When an operator tries to bisect an angle (a task found in range finding, tuning, and photometric measurements) he tends in the first 3 to 10 trials to become less and less accurate; he drifts in the direction of greater and greater positive error and settles on a particular range of values. A total of 20 subjects were required to make 120 consecutive bisections of an angle of 40^{o} on each of two successive days. The subject was blindfolded and never told during the experiment how well he had done. He sampled the angle twice by rotating the knob back and forth between two mechanical stops, and then tried to bisect it. Autocorrelation and power-spectrum analysis showed that operators on a knob-control angular-bisection task tend to porduce long wavelength drifts. The underlying process may be described by a Markoff process formulation; this means that the present state of the system governs its future development. (AD abstract)

5148
Weiss, B.,
P. D. Coleman, and R. F. Green
A STOCHASTIC MODEL FOR TIME-ORDERED DEPENDENCIES IN CONTINUOUS SCALE REPETITIVE JUDGMENTS. — Jour. Exper. Psychol., 50 (4): 237-244. Oct. 1955. DLC (BF1.J6, v. 50)

Same as item no. 5147.

5149
Weiss, H. S.
THE HUMAN ELECTROCARDIOGRAM DURING TUMBLING. — Jour. Aviation Med., 26 (3): 206-213. June 1955. DLC (RC1050.A36, v. 26)

Tumbling was simulated by using a horizontal turntable, 8 feet in diameter and capable of a speed of 200 r.p.m. Vector analyses were made of simultaneous electrocardiograms taken from limb and precordial leads of normal male subjects during tumbling. Within the range of tumbling exposures employed (limited by pain and or conjunctival petechiae), there was no evidence of cardiac function impairment. With the center of rotation (C/R) at the heart, a top speed of 118 r.p.m. was

attained; and with the C/R at the iliac crest, 93 r.p.m. was reached; both speeds were maintained for periods of 3 seconds. With the C/R at the heart, there occurred a clock-wise deviation of the QRS and T vectors in the frontal plane, an increase in heart rate, and prolongation of the corrected Q-T intervals. With the C/R at the iliac crest, a counter-clockwise deviation of the QRS vector in the frontal plane, a slight widening of the QRS-T angle, a decrease in heart rate, and a shortening of the corrected Q-T interval were noted. The deviation of the QRS vector with either C/R is interpreted on the basis of anatomical movements of the heart. The widening of the QRS-T angle and the changes in the corrected Q-T intervals are discussed in terms of possible effect of tumbling on myocardial function. (Author's summary, modified)

5150
Welkowitz, W.
MECHANICAL MECHANISM OF DESTRUCTIVE EFFECTS OF SOUND ON TISSUE. — Jour. Acoust. Soc. Amer., 27 (6): 1142-1144. Nov. 1955.
DLC (QC221.A4, v. 27)

A mechanical mechanism is presented to explain some of the nonthermal, noncavitation effects of high-intensity sound on tissue. The theory proposes that the observed effects result from unidirectional forces produced by the acoustic wave, and that these forces cause elastic failure in the system. Some experimental verification is presented from measurements on irradiated frog muscle tissue and on irradiated frog spinal cord. (Author's abstract)

5151
Werkman
[HIGH-ALTITUDE FLIERS WITH ONE LEG IN SPACE FLIGHT] Hoog vliegers met één been in de ruimtevaart. — De vliegende hollander (Amsterdam), 11 (1): 8-10. Jan. 1955. In Dutch.
DLC (UG635.N4V45, v. 11)

This is a general review of physiological and psychological problems of space flight, as they have been encountered in high altitude flights of today.

5152
Werkö, L.
[CLINICAL OPINIONS ON SYNCOPE] Kliniska synpunkter på svimning. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 4 (3): 2-4. 1955. In Swedish. DNLM

The symptoms of syncope are discussed together with illustrations of changes in orthostatic conditions which lead to or contribute to its development. Adequate blood circulation to the heart is mandatory to maintain the beat and minute volume during orthostatic or g stresses. Causes of syncope are summarized: circulatory, chemical, cerebral, as well as predisposing and provocative factors of psychogenic syncope: constitution, general physical condition, acute or chronic stress. The most important factors to watch out for in young, healthy individuals are the orthostatic reaction, psychogenic syncope, hyperventilation, hypoglycemia, and epilepsy. The orthostatic reaction may be avoided through hard physical training; a special form, postural hypotension, has no subjective symptoms and may be caused by reduced production of adrenaline and noradrenaline.

5153
Wertheimer, M.
THE VARIABILITY OF AUDITORY AND VISUAL ABSOLUTE THRESHOLDS IN TIME. — Jour. Gen. Psychol., 52 (1): 111-147. Jan. 1955.
DLC (BF1.J64, v. 52)

The data demonstrate reliable fluctuations in auditory and visual absolute thresholds in time; however, no clear correlation was obtained between fluctuations in both modalities. Variations in visual and auditory thresholds could not be adequately accounted for by such factors as meals, hyperventilation, satiation, disturbing entoptic phenomena, and experimental conditions, each of which may influence one or both modalities.

5154
Wesley, I.
[EFFECT OF COBALT ON THE RESISTANCE OF RATS TO HYPOXIA] Utjecaj kobalta na otpornost prema hipoksiji. — Archiv za higijenu rada (Zagreb), 6 (4): 289-294. 1955. In Serbo-Croatian, with English summary (p. 294).
DLC (RA421.A69, v. 6)

Rats were administered 0.5 mg. of cobalt (as chloride) per 100 g. body weight intraperitoneally, or a corresponding quantity of saline solution (controls). Three minutes after the injection they were decompressed in an altitude chamber at a fixed rate. The first apnea occurred at an average simulated altitude of 12,300 meters in the cobalt-treated rats, at 11,200 m. altitude in the controls; the second apnea (death) set in at the altitude of 13,500 m. and 12,500 m., respectively. Survival times at an altitude of 11,000 m. was 592.7 seconds in the experimental animals and 443.6 seconds in the controls. The death rate of animals kept at 10,400 m. altitude was 9/29 for the cobalt-treated and 17/29 for the saline-treated specimens. All three results indicate that cobalt increased the resistance of the rats to hypoxia. The possible mechanism of the action of cobalt is briefly discussed.

5155
Westen, R. J.
AN INVESTIGATION OF THE EQUIVALENCE OF TWO MEASURES OF MANIFEST ANXIETY [Abstract]. — Amer. Psychologist, 10 (8): 405. Aug. 1955. DLC (BF1.A55, v. 10)

This study investigates the relationship between two measures of anxiety (The Taylor Manifest Anxiety Scale, and a forced-choice version of it developed by Heineman), and the relationship of both to several measures of defense against anxiety, to two variables which appear to be related to amount of drive, and to an aptitude measure. The various scales were administered to a sample of 1,036 airmen about to enter an Air Force Technical School. Only 62% of subjects high on one anxiety measure were high on the other; only 58% of subjects low on one measure were low on the other. The two anxiety measures do not have the same functional relationships with all of the other variables. Some tentative evidence indicates that Taylor scale scores will correlate more highly with performance on certain kinds of learning tasks than will forced-choice scale scores. The data do not support the hypothesis that the forced-choice anxiety scale is merely a refined version of the Taylor scale.

5156
Wever, E. G.,
J. A. Vernon, and M. Lawrence
THE MAXIMUM STRENGTH OF THE TYMPANIC MUSCLES. — Annals Otol. Rhinol. and Laryngol., 64 (2): 383-391. June 1955. DLC (RF1.A6, v. 64)

The strengths of the tympanic muscles were measured by means of a strain gauge when these muscles were stimulated to maximum contraction by electric currents. Large individual differences were found, with means of 3.5 grams for the tensor tympani muscle when connected to the ossicular chain and 4.4 grams when freed of this connection. For the stapedius muscle the means were 1.6 grams for both "restrained" and "free" conditions. Evidence was obtained to show that the primary action of the muscles is to provide a damping of the vibratory motion of the ossicular chain, and their imposing of tension upon this system is only a secondary effect. Also, the tensions imparted by the two muscles are partly in opposition. The result is a protection of the inner ear against overstimulation by sounds with a minimum of displacement of the ossicular mechanism from its normal operating position. (Authors' summary)

5157
Wever, E. G.,
and M. Lawrence
PATTERNS OF INJURY PRODUCED BY OVERSTIMULATION OF THE EAR. — Jour. Acoust. Soc. Amer., 27 (5): 853-858. Sept. 1955.
DLC (QC221.A4, v. 27)

Measurements of the cochlear potentials as recorded from the round window were carried out on a series of guinea pig ears to ascertain the effects of injury by overstimulation with various tones. The results showed general impairments of the responses after such injury. With rare exceptions, the maximum responses to any tone are much less impaired than the sensitivity, and the maximums are more seriously affected for the low tones. In general, these changes are independent of the frequency of the tone producing the injury. These observations confirm those of earlier studies on the patterns of action of tones in the cochlea, and indicate that all tones when raised to extreme levels cause widespread damage to their hair cells. It is suggested that certain hair cells, which are normally involved in the peak actions of all tones, are particularly susceptible to damage by overstimulation. (Authors' abstract)

5158
Wever, E. G.
SOUND CONDUCTION IN THE EAR. — In: Office of Naval Research, Symposium on physiological psychology, p. 202-214. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100
UNCLASSIFIED

The characteristics of the sound transmission system in the middle ear are described. The results of experiments investigating the causal mechanisms of the intra-aural reflex (contraction of the stapedius and tensor tympani muscles in response to sound at high intensity levels, to reduce vibrations communicated through the ossicular chain) have raised a few speculations as to its protective potential. Furthermore, sources of distortion are discussed with the conclusion that the main sources lie in the inner ear under physiological conditions.

5159
Wever, E. G.,
and J. A. Vernon
THE THRESHOLD SENSITIVITY OF THE TYMPANIC MUSCLE REFLEXES. — A. M. A. Arch. Otolaryngol., 62 (2): 204-213. Aug. 1955.
DLC (RF1.A7, v. 62)

Reflex thresholds of the tensor tympani and stapedius muscles of the cat in response to sounds were studied utilizing visual, strain-gauge, and cochlear potential methods. Reflex thresholds were noted to vary with frequency and showed a close correlation with the sound intensities producing maximum cochlear potentials. Acoustic reflexes in the cat serve an emergency function and are elicited only when the sound intensity reaches a level at which the inner ear is severely overloaded and in danger of serious injury. Some ears do not exhibit the reflex for certain tones until the intensities are raised to a destructive level.

5160
Whalen, W. J.
SOME EFFECTS OF HYPERVENTILATION ON RESPIRATORY PATTERNS. — Amer. Jour. Physiol., 183 (3): 445-450. Dec. 1955.
DLC (QP1.A5, v. 183)

Respiratory responses to hyperventilation by a respiration pump during eupnea, panting, and sighing or gasping were studied in urethanized cats. The duration of apneic response to hyperventilation during eupnea was increased progressively with an increase in pump rate and inflation pressure. The return to rhythmicity was marked by rapid, shallow respiration of apparently diaphragmatic origin, indicating a greater sensitivity of the thorax than the diaphragm to hypocapnia. The response of thermally induced panting to hyperventilation was an acceleration of the respiratory rate proportional to the pump rate and presumably to the degree of hypocapnia. Sighing respiration, which was superimposed on the panting pattern, was eliminated by hyperventilation. Observations suggest that sighing is a response to CO_2 or pH changes intermediate between eupnea and panting. The contrasting effects of hypocapnia on the patterns studied suggest the existence of two functionally distinct respiratory centers, one reflexive and involved in panting, and the other chemosensitive, involved in eupnea and sighing.

5161
Wheeler, D. E.
MEASUREMENT OF INDUSTRIAL HEARING LOSS. — Noise Control, 1 (4): 9-15, 52. July 1955.
DLC (TA365.N6, v. 1)

A discussion is presented on the measurement of an individual's hearing in industry whether it is to provide a basis for comparison, treatment, or compensation. Measurements must be made with accurately calibrated, correctly used equipment in a test room or area where the noise background is low. The recommended test is pure-tone, air-conduction audiometry.

5162
Whillans, M. G.
HUMAN FACTORS IN AIRCRAFT DESIGN. — In: North Atlantic Treaty Organization, Anthropometry and human engineering, p. 113-123. London, Butterworths Scientific Publications, 1955.
DLC (TL500.N6, no. 5)

A general discussion is presented of the problems of vision, heat, safety, escape, and task simplification (instrumentation) in modern aircraft. Possible solutions produced through a human engineering approach to aircraft design are described.

5163
Whitcher, H.
RESPIRATORY RATTERNS AT DIFFERENT WORK RATES: THEIR CORRELATION WITH BREATH HOLDING TIMES AND MASKING TIMES. — Chemical Defence Experimental Establishment (Gt. Brit.). Directorate of Chemical Defence Research and Development. Porton Technical Paper no. 499, Aug. 23, 1955. 13 p. AD 75 988 UNCLASSIFIED

Respiratory patterns were studied at different work rates and during breath holding in subjects wearing oronasal masks connected to a spirometer. The mean reaction time did not vary significantly with the work rate. This time was about 1 second. The volume of air inhaled in this time did not increase with the work rate. Breath holding time decreased with the work rate but the intervening gasping times were independent of the work rate. The amount of air inhaled during the gasping times increased with the work rate. True breath holding was difficult to achieve, for in most circumstances some drift of air into or out of the lungs occurred. The mean masking time was 9.5 seconds. Indications of the volume of air inspired before complete adjustment of the gas mask was attained were given for different rates of work. (Author's summary, modified)

5164
White, C. S.,
W. H. Lockyear, and Lester L. Smith
QUANTITATIVE EMISSION SPECTROSCOPY AS A MEANS OF ANALYZING RESPIRATORY GASES. — Jour. Aviation Med., 26 (2): 104-116. April 1955. DLC (RC1050.A36, v. 26)

A Beckman DU Spectrophotometer was modified to study the emission spectra of dry nitrogen, oxygen, and carbon dioxide when the gases were energized electrically in an evacuated quartz discharge tube. The emission spectra of nitrogen, oxygen, and carbon dioxide were determined from 2000 Å to 5000 Å at a tube pressure of 1000 microns and from 2000 Å to 5800 Å at pressures of 200 microns. Determination of the carbon dioxide content of a gas might be possible near 5640, 5580, 5180, 4820, 2880, 2820, 2658 Å, and between 2000 and 2200 Å. If the ratio of nitrogen and oxygen in the gas which was investigated remained constant, then the exploration of the region of 4820 Å from 4810 and 4840 Å indicated that the emission at 4815 Å was of use in CO_2 analysis. This method was found to be inadequate for the determination of CO_2 in expired air from subjects breathing pure oxygen, because of the variation in the oxygen-nitrogen ratio. (Authors' summary, modified)

5165
White, C. S.,
and W. R. Lovelace
RECENT ADVANCES OF INSTRUMENTATION IN AVIATION MEDICINE. II. SPECTROMETRIC METHODS: GAS ANALYSIS BY QUANTITATIVE EMISSION SPECTROSCOPY. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 86-104. London: Butterworths Scientific Publications, 1955. DLC (TL500.N6, no. 6)

The nitrogen meter developed by Lilly and Anderson in 1944 is described, and modifications introduced by later investigators are discussed. Practical suggestions are given for the elimination of distorting factors in the operation of the apparatus.

5166
Whittingham, H. E.
MEDICAL SCIENCE AND PROBLEMS OF FLYING. — Brit. Med. Jour. (London), No. 4909: 303-309. Feb. 5, 1955. DLC (R31.B93, No. 4909)
Also issued as: Flying Personnel Research Committee (Gt. Brit.). Report no. 915, 1955. 20 p. LC-Sci

A review is presented of the contributions which applied physiology has made to aerial warfare, chiefly as they concerned the British Royal Air Force during the main phases of World War II. Noted is the design and study of: (1) flight equipment, such as oxygen supply systems; (2) survival equipment (ejection seats, immersion suits, life jackets), and (?) of the aircraft interior (instrument panels, cockpit and cabin lighting). Also mentioned is the role of physiology in the development of equipment to prevent blackout and equipment for cabin pressurization, air-conditioning and cooling, and in the design of aircraft seats to lessen fatigue. (120 references)

5167
Whittow, G. C.
EFFECT OF ANTI-HISTAMINE SUBSTANCES ON COLD VASODILATATION IN THE FINGER. — Nature (London), 176 (4480): 511-512. Sept. 10, 1955. DLC(Q1.N2, v. 176)

A study was conducted of the effects of oral administration of the antihistaminics diphenhydramine hydrochloride (Benadryl) and promethazine and promethazine hydrochloride (Phenergan) on vasodilatation in the finger during immersion in cold water. Diphenhydramine hydrochloride had no effect on the cold vasodilator response, but reduced the size of a wheal produced by placing histamine acid phosphate on the skin. Promethazine hydrochloride caused a significant reduction in the size of the histamine wheal and in the vasodilator response. When introduced into the fingertip by iontophoresis, promethazine hydrochloride increased the cold vasodilatation. The inhibition of the vasodilator response by systemic administration of the drug is accredited to its central depressant action.

5168
Wickett, J. C.
AVIATION MEDICINE. — Canad. Services Med. Jour. (Ottawa), 11 (1): 29-32. Jan. 1955. DNLM (W1.CA4826, v. 11)

The flight surgeon combines the skills of physician, engineer, scientist, teacher, and airman. As a physician he is responsible for the medical examination of the aircrew, particularly during initial selection; as an engineer he advises on the development of aircraft and their armament based on man's physiological and mental potential; as a scientist

he is constantly searching for better ways to protect the man in the air and increase his effectiveness. With other specialists he executes research on flight clothing, pressure suits, oxygen systems, survival equipment, etc. As a teacher he instructs the aircrew on the use of accoutrements and on the principles of aeromedicine. His duties also include investigation of fatal accidents, wastage rates of aircrew training and grounding of aircrew members for medical reasons.

5169
Wiese, K.
[THE PROBLEM OF RADIATION IN SPACE] Das Problem der Strahlung im Weltraum. — In: Probleme aus der astronautischen Grundlagenforschung [3rd International Astronautical Congress, (Stuttgart, 1952), Proceedings], p. 188-200. Stuttgart, 1952. In German. DLC (TL787.I44, 3rd, 1952)

The nature of radiation in space is reviewed. The biological effects of electromagnetic radiation of the sun are treated separately for visible light, ultraviolet rays, rontgen, gamma, infrared, and electrical radiation. The existence of particles in the interplanetary space is discussed in reference to charged-particle streams in the magnetic field of the Earth and also electromagnetic wave radiation due to acceleration or retardation of electrons. Collision of high-energy protons with matter initiates nuclear transformation resulting in neutron radiation. Besides cosmic primary radiation, use of nuclear energy in space ships will add secondary gamma and neutron radiation of high penetrating capacity. Effective screening of this radiation will prove to be extremely important for protection against biological impairment.

5170
Wiesinger, K.,
and F. Langraf
[ETIOLOGY, SIGNIFICANCE, AND PROPHYLAXIS OF DEAFNESS IN THE FLIER] Entstehung, Bedeutung und Bekämpfung der Schwerhörigkeit des Fliegers. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 171-177. 1955. In German, with English summary (p. 177) DLC (TL503.W5563, v. 1954)

The significance of occupational deafness in aircrews is confirmed by statistical evidence. Hearing loss is caused by both barotraumatic damage and chronical exposure to noise. In general, jet engine noises are more damaging to the ear than piston-engine noises. Some protection against baratrauma is accorded by cockpit pressurization. Pure-tone audiometry is inadequate for a correct evaluation of speech perception in noise and should be supplemented by vocal audiometry. Since there is no effective treatment for permanent hearing damage by noise, all efforts must be directed towards prophylaxis through collective and individual protective measures. Earplugs which filter out the high-frequency sound permitting passage of low frequency sound and oral communication are recommended for the airman. Other measures include training, supervision, and education of the crew in protective measures. There is no reliable method as yet for detection of individuals particularly susceptible to hearing damage by noise.

5171
Wiesinger, K.
[TESTS OF CARDIOVASCULAR FUNCTION FOR MEDICAL EXAMINATION OF SPORTSMEN] Die Kreislauffunktionsprüfung bei der sportärztlichen Kontrolluntersuchung. — Schweizerische Zeitschrift für Sportmedizin (Genève), 2: 97-123. 1954. In German, with English summary (p. 123). DNLM

The author reviews tests of cardiovascular function used for medical supervision of military pilots and recommends that the same be employed for periodic medical examination of sportsmen. Shellong's test of circulation is suggested as particularly suitable.

5172
Wiesinger, K.
[ON THE INFLUENCE OF HIGH ALTITUDE CLIMATE ON SEVERAL RHYTHMS] Über den Einfluss des Höhenklimas auf einige Rhythmen. — Acta medica scandinavica (Stockholm), Suppl. 307: 194-195. 1955. In German. DNLM

Measurements of the diurnal variation in the protrusion of the eyeball showed a distinct rhythm in most subjects. The globe protruded up to 0.5 mm. farther out in the morning than at night. Ascent to 3475 m. altitude (Jungfraujoch) produced a slight exophthalmus and a definite damping of the diurnal rhythm in protrusion of the eyeball. An explanation may be found in a general lowering of the excitatory threshold of the nervous system. The rhythm reappears after a week's acclimatization to altitude. In addition, there was a damping of the amplitudes of pupillary constriction and the diurnal temperature curve during the first week on the mountain.

5173
Wilkening, W. O.
ANTINEGATIVE G VALVE MECHANISM. — The Aro Equipment Corp., Bryan, Ohio. U. S. Patent 2,735,425. Feb. 21, 1956. 5 leaves. DP

An apparatus is described which regulates the admission of air under pressure to airmen's helmets to compensate for negative g acceleration without interfering with normal respiration.

5174
Williams, D.
A CONSTRUCTIONAL METHOD FOR MINIMISING THE HAZARD OF CATASTROPHIC FAILURE IN A PRESSURE-CABIN. — Royal Aircraft Establishment (Gt. Brit.), Farnborough. Technical note no. Structures 156, March 1955. 14 p. AD 74 443 UNCLASSIFIED

A method is put forward for substantially reducing the chances of a local failure in the shell of a pressure-cabin from developing into catastrophic failure of the cabin. The increased safety is achieved without weight penalty, and consists essentially in using closely-spaced (10 inches or thereabouts) transverse flat bands, the material for which is obtained by reducing the sheet thickness normally available for the shell walls. (Author's summary)

5175
Williamson, S. M.
PERSONAL PROTECTIVE DEVICES AGAINST NOISE. — Indus. Med. and Surg., 24 (9): 406-407. Sept. 1955. DLC (RC963.A37, v. 24)

A brief discussion is presented on the use of personal protective devices against noise by personnel in the aircraft industry. The results of use of personal protective devices may be summarized as follows: (1) Ear plugs — The V-51 plug gives good protection for high frequency but poor protection at low frequencies; attentuation of 35 decibels at frequencies above 2000, and 5-8 decibels at low frequencies were obtained. (2) Muffs — Give good attentuation at high frequency but poor protection at low frequencies; they were found to be expensive in comparison to ear plugs for the slight extra protection they afforded. (3) Helmet and muff combination — Gives about the same protection as the muffs; 5-8-10 decibel attentuation at frequencies below 2000 c.p.s. is the maximum obtainable in actual practice.

5176
Wilson, D.,
and G. H. Dhenin
SOME ASPECTS OF AVIATION MEDICINE IN REGARD TO RADIOLOGICAL HAZARDS. — Proc. Roy. Soc. Med. (London), 48 (1): 1-4. Jan. 1955. DLC (R35.R7, v. 48)

A discussion of the possible radiological hazards to aircrews includes: (1) ionization effects of cosmic radiation on high-flying aircraft; (2) inhalation and ingestion hazard on high-flying passenger aircraft following a series of atomic bomb tests far away, and (3) hazards both of primary radiation and inhalation and ingestion for military aircraft sampling during these tests. A project is described for obtaining a radioactive sample by flying into a cloud produced by the British atomic explosion at Montebello in October 1953. Realistic estimates are made of the possible dangers to be encountered in the project along with preparatory measures for dealing with them.

5177
Wilson, H. T.,
and G. B. Schroering
THE AIR EVACUATION OF PATIENTS WITH POLIOMYELITIS. — School of Aviation Medicine, Randolph Field, Tex. Jan. 1955. 7 p. (Project no. 21-1602-0001, Report no. 1). AD 221 730. PB 116921
Also published in: Jour. Amer. Assoc., 158 (5): 372-375. June 4, 1955. DLC (R15.A48, v. 158)

Clinical care during aerial transportation of poliomyelitis patients is discussed. Emphasis is placed on the need for early tracheotomy, careful attention to remove secretions, and maintenance of adequate pulmonary ventilation at all times. Methods used by the School of Aviation Medicine polio team are described. In essence, a well-instructed team including a doctor, nurse, and medical technician trained in the principles of respiratory and tracheotomy care is essential. In addition, 112 patients transported by air were analyzed for evidence of in-flight and post-flight effects.

5178
Windle, C.,
H. McFann, and J. Ward
THE EFFECT OF VARIOUS INTERVIEW TECHNIQUES IN EVOKING FEAR RESPONSES. — Jour. Clin. Psychol., 11 (2): 171-173. April 1955. DLC (RC321.J74, v. 11)

Three interviewing techniques were employed in an attempt to evoke admission of fear from 90 Airborne trainees who denied being afraid of jumping from the 34-foot mock tower used in training. The technique of disagreeing with the subject's denial of fear was found to be more effective than the technique of showing surprise or the technique of overamplifying his statement. (Authors' summary)

5179
Winterstein, H.
[THE CHEMICAL REGULATION OF RESPIRATION] Die chemische Steuerung der Atmung. — Ergebnisse der Physiologie biologischen Chemie und experimentellen Pharmakologie (Berlin), 48: 328-528. 1955. In German. DNLM

The chemical regulation of respiration is reviewed with emphasis on contemporary findings. The effects of the following special conditions are considered: carbon dioxide, acute and chronic hypoxia, hypercapnia, hyperoxia, acclimatization to high altitude, hyperthermia, hypothermia, and sleep.

5180
Witzleb, E.,
H. Bartels, H. Budde, and M. Mochizucki
[EFFECT OF ARTERIAL O_2 PRESSURE ON THE CHEMORECEPTOR ACTION POTENTIALS IN THE CAROTID SINUS NERVE] Der Einfluss des arteriellen O_2-Drucks auf die chemoreceptorischen Aktionspotentiale im Carotissinusnerven. — Pflügers Archiv für die gesamte Physiologie (Berlin), 261 (3): 211-218. 1955. In German. DLC (QP1.A63, v. 261)

Carotid-sinus nerve impulses were electrically recorded in anesthetized cats hyperventilated with varying concentrations of oxygen. At arterial O_2 pressures of 80-115 mm. Hg (normal-or nearly normal) small decreases in arterial O_2 pressure resulted in sharp increases in the frequency of the action potential of the nerve. At hyperoxic arterial O_2 pressure levels the potential was decreased nearly to zero. At oxygen pressures below 70 mm. Hg (hypoxia) the action potential, already at a high frequency level, increased only slightly with further decreases in arterial O_2 pressure. As the experiment continued, the gradual loss of blood through sampling tended to increase the potential frequency to a high level, regardless of the level of arterial O_2 pressure.

5181
Woerden, J. v.
[ANTI-G AND SURVIVAL SUITS FOR HIGH ALTITUDES] Anti-g- en survival-pakken voor grote hoogten. — Technisch Documentatie Centrum voor de Krijgsmacht (Netherlands), Report WO 5796, Nov. 11, 1955. v+19 p. In Dutch. AD 91 032 UNCLASSIFIED

A brief summary of the use of anti-g and survival suits for high altitudes is followed by a list of 25 references including abstracts and titles from articles, manuals, and reports.

5182
Wolf, E.,
and M. J. Zigler
COURSE OF DARK ADAPTATION UNDER VARIOUS CONDITIONS OF PRE-EXPOSURE AND TESTING. — Jour. Optical Soc. Amer., 45 (9): 696-702. Sept. 1955. DLC (QC350.Q6, v. 45)

Dark adaptation curves are obtained by presenting a 2° square test-field 6° below the center of the fovea for both eyes tested separately and for both eyes tested alternately. When the pre-exposure luminances for the two eyes differ, the independently recorded dark adaptation curves for the two eyes show differences in correspondence with the difference in radiant energy delivered to the eyes during pre-exposure. However, if both eyes are pre-exposed simultaneously to their respective luminances, and are alternately tested, the dark adaptation curves are not identical with those previously found. They move closer together, or coincide, i. e., the differences in threshold sensitivity become smaller, or disappear. When pre-exposure of the two eyes differs merely in admitting the near ultraviolet (285-400 mμ) to one eye, and screening it from the other, the curves independently recorded for the two eyes have different threshold levels, but in alternate testing no difference is found. It is also shown that an influence of the near ultraviolet upon visual thresholds is readily found when white and blue testlights are employed; it is barely evident when a green testlight is used and is not found with a red testlight. (Authors' abstract)

5183
Woodbury, D. M.,
L. T. Rollins, G. G. Richards, and P. S. Timiras
EFFECTS OF OXYGEN AND CARBON DIOXIDE INHALATION ON BRAIN EXCITABILITY IN MICE AND RATS [Abstract]. — Federation Proceedings, 14 (1[I]): 395-396. March 1955.
DLC (QH301.F37, v. 14)

The electroshock seizure threshold (EST) of the brains of mice and rats was decreased by hypoxic decreases in the concentration of O_2 in inhaled air, and increased by hyperoxic increases. The decreased threshold resulting from 10% oxygen could be counteracted by simultaneous administration of 12.5% carbon dioxide. Increases in carbon dioxide concentrations from 7.5 to 20% in air caused a progressive increase in EST, while a concentration of 30% had no effect. Rapid withdrawal of mice from high concentrations of carbon dioxide resulted in clonic or tonic-clonic seizures within 2 minutes.

5184
Woodson, W. E.
HUMAN ENGINEERING GUIDE FOR EQUIPMENT DESIGNERS. — 7+93+29+35+29+16+1+2 p. Berkeley and Los Angeles: Univ. of California Press, 1954.
DLC (TA175. W6)

A guide is presented which is intended to aid the designer in making optimum decisions wherever human factors are involved in man-operated equipment by providing a central source for information about the human operator, by pointing up the relative importance of variables, and by indicating solutions for typical design problems. Included are chapters titled (1) Design of Equipment and Workspace; (2) Vision; (3) Audition; (4) Body Measurement; and (5) Other Factors.

5185
Worchel, P.
THE VESTIBULAR ORGANS IN SPACE ORIENTATION. — Perceptual and Motor Skills, 5 (3): 164. Sept. 1955. DLC (BF311.P36, v. 5)

Two groups of deaf subjects, with and without vestibular sensitivity, were blindfolded and led over a path describing two legs of an isosceles triangle and had to return alone to the starting point over a base line of 114 ft. Each subject received 5 trials. Both the distance from the starting point and angular deviation from the base were calculated. There was no significant difference in regard to angular deviation; however, the group with intact vestibular senses came significantly closer to the starting point. It is concluded that kinesthesis is effective over short distances, but the vestibular organs play a dominant role over long distances.

5186
Worlev, T. W. 1954
NIGHT VISION TRAINER. — U. S. Air Force Medical Service Digest, 5 (4): 17. April 1954.
DLC

A project was undertaken to design and develop an effective night vision trainer that could be made locally at base level. A satisfactory simple silhouette projector was constructed for approximately $31.00 from standard Air Force aircraft electrical equipment available from base supply or from class 26 aircraft.

5187
Wünsche, O. 1954
[CONTRIBUTIONS OF BASIC RESEARCH IN AVIATION MEDICINE TO CLINICAL THERAPY] Beiträge aus der luftfahrtmedizinischen Grundlagenforschung zur klinischen Therapie. — Jahrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt (Braunschweig), 1954, p. 222-225. 1955. In German, with English summary (p. 225).
DLC (TL503.W5563, v. 1954)

Basic research in aviation medicine has made important contributions to the theory and practice of medicine in general. Clinical therapy particularly has derived benefits from research on the mechanical and chemical effects of lowered atmospheric pressure. The compensatory reactions of the organism evoked by treatment with simulated altitude have been beneficial in bronchitis, bronchial asthma, sinusitis, anemia, and whooping cough. Experiments were conducted to clarify the nonspecific response of the organism to high altitude. Animals repeatedly exposed to 4000 to 8000 m. altitude showed a tendency to decreased blood albumin and continuous increase in blood gamma globulin, and a marked increase of blood lipase. These results are discussed in relation to general capacity of the organism to resist acute infections.

5188
Wulfften Palthe, P. M. van
[BIOLOGICAL ASPECTS OF ELECTROENCEPHALOGRAPHY] Biologische aspecten van de electroencephalografie. — Nederlandsch tijdschrift voor geneeskunde (Amsterdam), 99 (49): 3695-3710. Dec. 3, 1955. In Dutch. DNLM

Same as item no. 3665, vol. III.

5189
Wulfften Palthe, P. M. van
ELECTRO-ENCEPHALOGRAPHIC EXAMINATION IN HEALTHY YOUNG MEN. — Aeromedica acta (Soesterberg, Netherlands), 4: 81-97. 1955. In English. DNLM

Three hundred electroencephalograms taken in the course of aeromedical examinations were se-

lected for detailed study (90 of them had been made for documentation purposes; 210 were indicated by medical history). All subjects were considered to be in good health at the time of examination. The resting curves in the majority showed alpha rhythm. Hyperventilation in a fasting condition provoked delta waves in 29% of the cases (62 airmen), which were abolished by ingestion of glucose. Anomalies of sugar metabolism were found in four cases where delta activity was not abolished by sugar. Cessation of delta activity was related to the rise in blood sugar from the initial level, rather than the absolute level of blood sugar. No significant relation was found between neurological involvement and appearance or nonappearance of the positive hyperventilation effect for this group. Appearance of dysrhythmia and sleep spindles in resting subjects (30 cases) had some relation to certain data in medical history. Interesting findings were noted in relation to photic stimulation, hypoxia, and electrocardiogram. Documentation of EEG pattern for every airman is advised in view of the wide interindividual variability.

5190
Wulfften Palthe, P. M. van
MEDICAL TESTS FOR DETECTING LATENT EPILEPSIA AND FLUCTUATIONS IN THE LEVEL OF CONSCIOUSNESS. — In: North Atlantic Treaty Organization, Advisory Group for Aeronautical Research and Development, Collected papers on aviation medicine, p. 31-40. London: Butterworths Scientific Publications, 1955.
DLC (TL500.N6, no. 6)

Essentially the same as item 3667, vol. III.

5191
Wyckoff, L. B.,
and J. B. Sidowski
PROBABILITY DISCRIMINATION IN A MOTOR TASK. — Jour. Exper. Psychol., 50 (4): 225-231. Oct. 1955. DLC (BF1.J6, v. 50)

This study investigated the effects of exclusion of certain features of verbal conditioning on the performance of an intermittently reinforced tracking task requiring anticipatory responses. The instructions avoided structuring the situation as a problem-solving or guessing task. The targets were released in random sequence with a fixed percentage from each side (25, 40, 50, 60, 70 and 75%). Amount of time-on-target required for a hit was .3 sec. or .5 sec. for subgroups on each target frequency. The performance of the .5-sec. group was considerably higher than the level of a matching solution approaching that of an optimal solution. The lesser improvement shown by the .3-sec. group is explained by the fact that it was possible to score hits even though the anticipation was incorrect. Differences between previous experiments which supported a matching solution and present results are interpreted to be due to the elimination of the tendency to relate the task to past experience with guessing and problem solving, which interferes with the approach to an optimal solution.

5192
Wynne, J. R. W. 1953
RCAF PARA-RESCUE ORGANIZATION. — Jour. Aviation Med., 24 (5): 449-452. 1953.
DLC (RC1050.A36, v. 24)

The Royal Canadian Air Force organization for parachute rescues was activated in July, 1946. It is composed of the Army, Navy, Air Force, and Departments of Fisheries, Justice, and Transport. The Canadian territory and its approaches are divided into five areas, each with its own rescue coordination center. Jump teams are maintained in each of these areas; such teams are made up of a jumpmaster and a crew which includes a physician and a nurse. All members of the jump team must be trained for a period of 4-5 months, and each member must make a total of 10 parachute descents before completing the course. To date, 8 nurses and 5 medical officers have completed the course. The author describes a rescue operation.

5193
Wyss, V.
[IMPORTANCE OF THE ACTS OF REBREATHING ON THE DURATION OF VOLUNTARY APNEA AND ITS FINAL ALVEOLAR CO_2 AND O_2 VALUES] Importanza di atti di rirespirazione sulla durata dell' apnea volontaria e sui valori alveolari finali del CO_2 e dell'O_2. — Rivista di medicina aeronautica (Roma), 18 (3): 732-753. July-Sept. 1955. In Italian, with English summary (p. 749).
DLC (TL555.A1R5, v. 18)

Simple voluntary inspiratory apnea in five normal persons between 22 and 34 years of age lasted from a minimum of 48 seconds to a maximum of 122 seconds; with a terminal alveolar CO_2 concentration of 6.88 - 7.36%, and an alveolar oxygen concentration between 8.11 and 10.47%. In comparison, the same subjects with inspiratory apnea interrupted at approximately 20-second intervals by rebreathing the same air held their breath from 81 to 252 seconds, an increase of 68 to 107%; the alveolar CO_2 concentration was 7.28 - 8.06%, an increase of 5.49 to 8.68%, and the alveolar oxygen concentration between 5.72 to 6.65%, an overall decrease of 29.6 to 36.39%. It is presumed that the movements of rebreathing prolong the capacity to maintain apnea by their effects on the pulmonary circulation and the distribution of intrapulmonary vases. In addition to the chemical factors, neuromuscular factors involving the thoracic motor apparatus and diaphragm have a relation to the duration of apnea.

5194
Wyss-Dunant, E.
[THE SHOCK OF ACCLIMATIZATION: OBSERVATIONS IN THE HIMALAYA] Lo shock d'acclimatazione: osservazioni all' Himalaja. — Minerva medica (Torino), 46 (21): 675-685. March 14, 1955. In Italian. DNLM
Also published in: Praxis (Bern), 43 (39): 825-836. Sept. 30, 1954.

Same as item 2286, vol. II.

5195
Yazigi Jáuregui, R. 1954
[MAJOR CURRENT PROBLEMS OF AVIATION MEDICINE] Los grandes problemas actuales de la medicina de aeronáutica. — Revista de la Fuerza aérea (Santiago de Chile), 14 (54): 5-9. July-Sept. 1954. In Spanish. DLC (UG635.C5A32, v. 14)

An analysis is presented of the principal problems of aviation medicine. The factors affecting man in high-altitude, high-speed aircraft are related to altitude (anoxia, gas expansion, aeroembolism, temperature, radiation, explosive decompres-

sion); acceleration and deceleration; temperature; illumination and vision; noise; toxicity of fuels; escape methods and rescue; and fatigue.

5196
Young, D. R.,
and S. F. Cook
BODY LIPIDS IN SMALL MAMMALS FOLLOWING PROLONGED EXPOSURES TO HIGH AND LOW TEMPERATURES. — Amer. Jour. Physiol., 181 (1): 72-74. April 1955.
DLC (QP1.A5, v. 181)

Mice and rats were exposed to temperatures of 4°, 24°, or 35° C. for 30-36 or 130-150 days. Animals exposed to the low environmental temperature showed no growth, consumed more food, and deposited less total lipids than 24° controls. Animals exposed to the high temperature consumed less food, but grew as well as controls and deposited similar quantities of lipids. The melting point of fatty acids extracted from the carcass of rats tended to rise with increasing environmental temperature, while that of skin fatty acids was the same regardless of environmental temperature.

5197
Young, D. R.,
and S. F. Cook
EFFECT OF ENVIRONMENTAL TEMPERATURE AND DIETARY PROTEIN ON URINARY NITROGEN EXCRETION OF RATS. — Proc. Soc. Exper. Biol. and Med., 89 (3): 482-484. July 1955.
DLC (QP1.S8, v. 89)

Adult male rats, maintained on a low protein diet adequate for normal growth and function (5.3%), were exposed to three environmental temperatures, 4°, 23°, and 35° C., for 50 days. Measurements of total urinary nitrogen as well as food intake and changes in body weight were made every third day between the tenth and fiftieth day of exposure. Food intake, total urinary nitrogen, and the various urinary fractions, urea, allantoin, and creatine, were found to be inversely proportional to the exposure temperature. Excretion of the uric acid, ammonia and amino acids, and creatinine bore no apparent relation to external temperature. The changes in urea, allantoin, and creatine excretion reported here are proportional to the metabolic stresses imposed by high and low temperature. (Authors' summary, modified)

5198
Young, R. W.
A BRIEF GUIDE TO NOISE MEASUREMENT AND ANALYSIS. — Navy Electronics Lab., San Diego, Calif. NEL Report no. 609, May 16, 1955. 23 p.
AD 66 686 PB 118036

Basic noise-measurement principles and techniques are treated in Part I, by the use of only simple arithmetic. Terms peculiar to noise analysis are explained. Special attention is given to interpreting graphs of noise spectra obtained with analyzers of different bandwidths. Part II describes specific calibration procedures. It also gives the mathematics used in calculating sound-pressure levels, spectrum levels, and combinations of levels. (Navy Electronics Lab. abstract)

5199
Young, V. M.
SAFETY SLING FOR OCCUPANTS OF AIRCRAFT. U. S. Patent 2,705,586. April 5,1955. 6 leaves.

A sling designed to restrain the torso and internal organs during strong deceleration is described.

5200
Zaccaria, M. A.,
J. Schmid, and S. Klubeck
A SIMPLE PROCEDURE FOR DEVELOPING EQUIVALENT FORMS OF INTEREST OR PERSONALITY QUESTIONNAIRES. — Psychol. Reports, 1 (1): 37-41. March 1955. DLC (BF21.P843, v. 1)

A simplified method is described for the development of parallel or statistically equivalent forms of tests having scaled items, for example, attitude, personality, or interest inventories. Three criteria used in pairing of items were popularity level, phi coefficients, and item content.

5201
Zeaman, D.,
and N. Wegner
A CARDIAC REFLEX TO TONES OF THRESHOLD INTENSITY. — Univ. of Connecticut, Storrs (Contract Nonr-631(00), Technical Report no. 13); issued by Office of Naval Research, Washington, D. C. July 1955. 7 p. +2 graphs. AD 75 440 PB 123053

The human cardiac reflex (change in pulse rate) to auditory stimulation was measured at three widely separated intensity levels (threshold level, above threshold, and below threshold). The possibility of its use as a sensitive, objective test of hearing was established by demonstrating with normal adult subjects the presence of the heart response to tone intensities at verbally reported thresholds. As an objective test of hearing the use of this reflex was observed to be simple from the point of view of equipment and procedure, but somewhat tedious. (Authors' summary, modified)

5202
Zimmer, H.
PREDICTIONS BY MEANS OF TWO PROJECTIVE TESTS OF PERSONALITY EVALUATIONS MADE BY PEERS. — Jour. Clin. Psychol., 11 (4): 352-356. Oct. 1955. DLC (RC321.J74, v. 11)

This experiment sought to determine the accuracy with which specific personality characteristics can be predicted by means of two projective tests: a sentence completion test and human figure drawings. The criterion scores on eight personality traits for 73 subjects were derived from the rankings of each subject by his fellow bomber crew members. These rankings were normalized, pooled, and corrected for differences in error variance, due to differences in the size of crews. The obtained median reliability of criterion scores was .82. Three judges attempted to predict the criterion scores by means of a "blind," over-all evaluation of each projective test, judged independently. Median interjudge reliability was .32 for each test. The median correlations between judges' predictions and the criteria were .15 for the sentence completion test, .16 for the human figure drawings, and .17 for the judges' pooled evaluation of both tests employed independently. There was a wide range in predictive efficiency with individual r's ranging from -.18 to .44. (Author's summary)

5203
Zotterman, Y.
[THE FUNCTIONS OF THE THERMORECEPTORS] Die Funktionen der Thermorezeptoren. — Acta

neurovegetativa (Wien), 11 (1-4): 130-141. 1955. In German, with English summary (p. 140). DNLM

Impulse discharges in single cold- and heat-conducting fibres were recorded in response to well defined and thermoelectrically controlled thermal stimuli applied to the cat's tongue. The results can be summarized as follows: (1) The thermoreceptors display a stationary discharge when the receptor layer of the tongue is kept at a constant temperature; the frequency of this discharge is entirely a function of the prevailing temperature, i.e., the thermoreceptors function as a thermometer. (2) The thresholds and maxima of this stationary discharge of a single thermal fibre are distributed over a rather wide temperature range; between 45° and 50° C. the cold fibres display a "paradoxical" stationary discharge. (3) During changes in the temperature the frequency of the discharge is influenced by both the temperature and the rate of change; upon rapid warming of the tongue to a higher temperature level, the cold impulses disappear at first, then return slowly and attain a final frequency of discharge. (4) Menthol as well as acetylcholine in minute amounts enhance the discharge of the thermal nerve endings. (Author's summary)

5204
Zuidema, G. D.,
R. Edelberg, and E. W. Salzman
A DEVICE FOR THE INDIRECT RECORDING OF BLOOD PRESSURE. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical Note no. 55-427, Sept. 1955. iv+7 p. (Project no. 7216, Task no. 71712). AD 93 634 UNCLASSIFIED

A device for the repeated recording of blood pressure without arterial puncture has been developed for use in the experimental work on the heart and circulation. Pulse waves from the brachial artery are picked up by a plastic balloon underlying the conventional blood pressure cuff and recorded by means of a Statham pressure transducer and an oscillograph. The cuff is automatically inflated every 30 seconds and a tracing of the pressure fall recorded on the same paper. Since the systolic and diastolic pulse waves are easily recognized, their respective pressures are found by reference to the record of the pressure fall recorded simultaneously. This method, successfully employed in 90 determinations on 10 subjects, gave good results; the values agreeing accurately and consistently with those obtained by conventional means. Such a system should prove useful in wide areas of experimental work, including studies of the response of the body to stress. Its use in the high altitude low pressure chambers is described. (Authors' abstract)

5205
Zwislocki, J.
FACTORS DETERMINING THE SOUND ATTENUATION PRODUCED BY EARPHONE SOCKETS. — Jour. Acoust. Soc. Amer., 27 (1): 146-154. Jan. 1955. DLC (QC221.A4, v. 27)

The factors that affect the sound attenuation provided by earphone sockets, including leakage, vibration of the earphone system and skull, and sound conduction through the earphone cushion and shell, are analyzed on the basis of experimental evidence. An attempt is made to determine the practical limit of sound attenuation attained by earphone sockets when comfort and sound transmission from the earphone to the ear are considered. For frequencies below 700 c.p.s. the attenuation is limited by the mass of the system and the impedance of the flesh under the earphone cushion. For frequencies above 700 c.p.s. bone conduction is the determining factor. (Author's abstract, modified)

5206
Zwislocki, J.
THE NATURE OF AUDITORY STIMULI AND THEIR ATTENUATION. — In: Office of Naval Research, Symposium on physiological psychology, p. 182-190. ONR Symposium Report ACR-1, March 10-11, 1955. AD 80 100 UNCLASSIFIED

Conflicting experiments are analyzed in regard to whether or not there is an increase in the amplitude of vibration along the cochlea upon increase of frequency. It was possible to establish fundamental differences in stimulus control between both experiments. A hypothesis which reconciles apparent contradictions with the place theory, is proposed as follows: when the amplitude of the stapes vibration is constant, cochlear microphonics in the basal turn must increase with frequency; when cochlear microphonics are constant, the amplitude of stapes vibration must decrease with frequency. Application of these principles in the design of ear muffs and ear plugs is discussed.

5207
Zwislocki, J.
SEMIPLASTIC EARPLUGS. — Jour. Acoust. Soc. Amer., 27 (3): 460-465. May 1955. DLC (QC221.A4, v. 27)

The development of an earplug with soft elastic walls and a viscous core malleable at body temperature is described. The problems of suitable material, shape, and size are considered as well as the shape and size adaptability. The earplugs have been found sufficiently comfortable to sleep with, and they ensure a sound attenuation equal to or better than any known earplug. One size fitted sufficiently well 90 percent of the ears of 25 people tested. (Author's abstract, modified)

SUBJECT INDEX

ABDOMINAL PRESSURE
effects of:
explosive decompression, IV: 3774
effects on:
blood pressure, II: 1106; III: 3085
circulation, II: 1064, 1105, 1512
heart function, II: 1512
respiration, II: 1064
role in:
pressure breathing, II: 1105
respiration, II: 1193, 1194; IV: 3921

ABILITY see Flying ability; Mental ability; Rhythmic ability

ABNORMALITIES see under Electrocardiogram; Heart. Also see items under Disorders; Disturbances

ABSENTEEISM
incidence, III: 3611

ACCELERATION
analysis, II: 1311
cause of:
anxiety, II: 1474
visual illusions, I: 251, 408, 409, 410; IV: 3884
effects on:
body fluid distribution, I: 368; II: 1441; III: 2786
brain sodium-potassium ratio, III: 2786; IV: 4204
cerebral circulation, I: 875
circulation, II: 1803; IV: 4095
eye movements, III: 3057
labyrinth, I: 408; II: 1474, 1550; III: 2852, 2975, 3057, 3412; IV: 4501
pilot performance, IV: 3752
psychomotor performance, IV: 4822
reaction time, III: 3539
spatial orientation, I: 251, 408, 409, 900
general physiological effects, I: 423; II: 1138, 1429, 2137; III: 2414, 3017, 3097, 3619; IV: 3900, 4205, 4863
test methods, II: 2125, 2126, 2132; III: 3477
general psychological effects, II: 1474; IV: 3900
in parachute jumping, IV: 4559
measurement, I: 602; II: 1311; III: 3039
tolerance see Acceleration tolerance

ACCELERATION (NEGATIVE)
cause of motion sickness, III: 3122
effects on:
brain, IV: 3809
cerebral circulation, I: 307, 308, 309
circulation, II: 1422
digestive system function, III: 3122
lung, IV: 3809
respiration, I: 307, 309
pathological effects, IV: 4638
protection, IV: 5173
tolerance, II: 1061; III: 2625, 3467; IV: 3809
time factors, IV: 4638

ACCELERATION (POSITIVE)
effects on:
arm movements, II: 1201
blood pressure, IV: 4506
brain metabolism, IV: 3910
cerebral circulation, III: 2461
electrocardiogram, I: 720
electroretinogram, IV: 4532
muscle metabolism, IV: 3910
peripheral vision, IV: 4531
potassium metabolism, IV: 3910
retinal circulation (see also Blackout), II: 1331, 1693

sodium metabolism, IV: 3910

urine composition, II: 1881

general physiological effects, IV: 3981

pathological effects, IV: 4638

tolerance (see also Anti-g procedures), I: 795; II: 1061, 1062, 1063, 1330, 1693, 2133; III: 2600, 2625; IV: 4951, 5017

effects of:

anti-g suits, IV: 4531

muscular tonus, IV: 4256

relation to:

circulation, IV: 4587

time factors, IV: 4638

ACCELERATION (SMALLER THAN 1 G) see Subgravity

ACCELERATION (TRANSVERSAL)

general physiological effects, II: 1332; III: 2785; IV: 4081

tolerance, I: 116; II: 1061, 1332; III: 3497; IV: 4081, 4999

ACCELERATION TOLERANCE (see also Anti-g suits; Impact tolerance)

effects of:

posture, I: 631; IV: 4061

prone position, I: 92, 478

supine position, I: 116; III: 2785

tilting, III: 2785

research methods, IV: 4337

reviews, III: 3630

test methods, III: 2716

ACCIDENT PRONENESS, I: 596, 610; II: 1084, 1398, 2164; III: 3448; IV: 4657, 4826

general physiological factors, I: 605

psychological factors, III: 3303; IV: 4488

relation to:

age, II: 1771

personality, IV: 4154, 5083

test methods, IV: 4751

tests, III: 3302

ACCIDENTS (see also Aircraft debris, hazards; Aviation casualties; Crash injuries; Ditchings), IV: 3927

analysis (see also subdivision Post-mortem findings), I: 522, 698, 818, 843; II: 1212, 1337, 1354, 1399, 1544, 1928, 2261; III: 2848, 2894, 2954; IV: 4172, 4320, 4321, 4395, 4677, 4798

cause of neuroses, IV: 4060

caused by:

fascination, II: 2059

glare, II: 2059

heart pathology, I: 9, 248

sensory illusions, II: 1250

visual illusions, II: 1251; III: 3422

engineering factors, I: 466, 603, 852; II: 1299, 2164, 2227; III: 2310, 3471; IV: 3708, 4586, 4656, 5119

environmental factors, IV: 4586

general psychological effects, II: 1874; III: 2639, 2796

human factors, I: 145, 211, 212, 213, 248, 249; II: 1085, 1237, 1239, 1251, 1299, 1337, 1398, 2059, 2164, 2214; III: 2331, 2339, 2612, 3226, 3271, 3320, 3334, 3471, 3494; IV: 3705, 3970, 3971, 3973, 4193, 4395, 4466, 4474, 4488, 4582, 4586, 4657, 4675, 4738, 4755, 4887, 4993, 5042, 5083, 5117, 5119

analysis, IV: 4058

investigation, IV: 4567, 4677

prevention (see also entries under Safety), I: 660, 661, 818; III: 2391; IV: 4466, 4754, 5119

bibliography, II: 1503

relation to:

climate, III: 2339

depth perception, I: 249

hyperventilation, IV: 4392

statistics, I: 40, 60, 169, 207, 208, 209, 210, 211, 212, 213, 482, 577, 660, 765, 852; III: 2371, 2391, 2685, 3322; IV: 3705, 4083, 4466, 4577, 4784, 4993, 5119

ACCLIMATIZATION see Altitude acclimatization; Carbon monoxide a.; Cold a.; Heat a. Also see entries under Adaptation and Adjustment

ACCOMMODATION see Visual accommodation

ACETYLCHOLINE METABOLISM

role in color vision, II: 1948, 1949

ACETYLSALICYLIC ACID

effects on labyrinth, II: 2859

ACHIEVEMENT TESTS, I: 295, 833, 848; II: 2178, 2197; III: 3175, 3176

ACID-BASE BALANCE see entries under pH

ACIDOSIS (see also Hypercapnia)

effects on:

cerebral circulation, II: 2060

voluntary apnea, III: 3510

ACOUSTICAL COMFORT, I: 576; II: 1951

ACOUSTICAL FILTERS, IV: 4646

ACOUSTICAL TRAUMA see Deafness. Also see Effects on hearing under Aerotitis media; Airplane flight; Airplane noise; Blast; Engine noise; Jet engine noise; Jet plane noise; Noise; Sound; Ultrasonic vibrations

ACTH see Adrenocorticotropic hormone

ACTION POTENTIALS see under Auditory nerve; Phrenic nerve; Spinal cord. Also see Electrocardiogram; Electroencephalogram; Electromyogram; Electro-oculogram; Electroretinogram. Also see entries under Electrical potentials

ACTIVITY CYCLE
effects on biological rhythms, IV: 4834

ACTIVITY RHYTHM
effects of:
environmental temperature, III: 3462
illumination, III: 2403; IV: 3746; 4169
effects on physical fitness, IV: 4799
relation to:
body temperature rhythm, III: 3013
diurnal cycle, III: 2402, 3013, 3154; IV: 3746, 4169, 4799
pulse rate rhythm, III: 3013

ACUITY see Visual acuity

ADAPTATION see Auditory adaptation; Color a.; Dark a.; General adaptation syndrome; Respiratory adaptation; Restraint a.; Retinal a. Also see entries under Acclimatization, Adjustment, and Lack of adaptation

ADAPTATION SYNDROME see General adaptation syndrome

ADAPTINOL see Xanthophyll and derivatives

ADENOIDS, II: 2083

ADENOSINE MONOPHOSPHATE
effects on blood plasma, II: 1820

ADJUSTMENT (see also entries under Acclimatization, Adaptation, and Habituation)
to training
relation to galvanic skin response, IV: 3845

ADMINISTRATIVE AND ORGANIZATION ASPECTS see under Aviation medicine; Dental service

ADRENAL ACTIVITY RHYTHM
relation to diurnal cycle, IV: 4294

ADRENAL GLANDS (see also Cortisone; Epinephrine; Steroids)
ascorbic acid content, II: 1012; III: 2417
effects of:
adrenocorticotropic hormone, IV: 4085
airplane flight, III: 3233
altitude, I: 227, 539; III: 3022
anoxia, I: 611, 614; II: 1582; III: 2527, 2936; IV: 5041, 5108
ascorbic acid, IV: 4085
carbon dioxide, III: 3429; IV: 4462, 4914
cold, II: 1842; III: 2645, 2646, 2995, 3193; IV: 4085
cold acclimatization, IV: 4019
heat, III: 2568, 3193; IV: 5041
hypercapnia, III: 3003, 3004, 3428
hyperoxia, II: 1054; IV: 4214, 4216
hypothermia, IV: 4102, 4103, 4198
mental stress, III: 2770
noise, I: 449; II: 1519; IV: 3739
physical work, II: 2220
stress, II: 1462, 1691; III: 2417
metabolism
effects of cold, IV: 4710
relation to:
blood pressure, III: 2770
cardiovascular system, III: 2938
role in:
altitude acclimatization, I: 491; II: 1411
anoxia, I: 491, 539, 611, 614; IV: 4693
anoxia tolerance, III: 2937, 3239
cold acclimatization, III: 2657, 2917, 2918, 2919, 3169, IV: 4048
cold tolerance, III: 2512; IV: 3862, 4346
fatigue, II: 1690, 1797
heat acclimatization, III: 2917
hematopoiesis, IV: 4801
hibernation, III: 2646
hyperoxia, III: 2799
hyperoxia tolerance, IV: 4215, 4971
lipid metabolism, IV: 4728
metabolism, III: 2513
potassium metabolism, IV: 4602, 4187
temperature regulation, IV: 3946, 4564

ADRENALINE see Epinephrine

ADRENOCORTICOTROPIC HORMONE
effects on:
adrenal glands, IV: 4085
anoxia tolerance, II: 2121; IV: 4598

ADVANCE INFORMATION
effects on:
mental performance, II: 1809, 1810
psychomotor performance, II: 1720; III: 2758, 3077, 3336; IV: 4323
spatial orientation, II: 1789
speech intelligibility, IV: 3851

AERIAL GUNNERS
training, II: 1160, 1466, 2007

AERIAL GUNNERY, II: 1046, 1410
training devices, II: 1160

AERIAL SEARCHING, II: 1360, 1751

AERODONTALGIA see Dental disturbances caused by altitude

AEROEMBOLISM see Decompression sickness

AEROMETEORITES see Aircraft debris

AEROPAUSE see High altitude

AEROPLAST, I: 238; II: 2101

AEROTITIS MEDIA, I: 48, 185, 292, 510, 511; II: 1206, 1302, 1381, 1702, 1940, 2045; III: 2575, 2666, 2984, 3054, 3063, 3242, 3372, 3567, 3632; IV: 3924, 4399

- effects on hearing, II: 1381
- incidence, II: 2042
- relation to dental anomalies, II: 2244
- treatment, IV: 4057, 4495

AFTEREFFECTS see under Hypothermia

AFTER-SOUND, I: 343

AGE (see also Age factors under Aviators; Personnel; Pilots)

- general physiological effects, III: 3138
- relation to:
  - accident proneness, II: 1771
  - air transportability, II: 1746
  - altitude tolerance, IV: 4164
  - anoxia tolerance, II: 1626
  - arteriosclerosis, I: 678
  - aviator performance, II: 2093
  - behavior, II: 1298
  - blood lipoid content, I: 644, 645; IV: 4218
  - body measurements, I: 656
  - bone conduction, II: 2171
  - cerebral circulation, II: 2061
  - circulation, III: 2559, 3324
  - cold tolerance, IV: 4164
  - dark adaptation, IV: 4584
  - decompression sickness, I: 270
  - diffusion of respiratory gases, III: 2602
  - electroencephalogram, I: 282
  - hearing, II: 976, 2171; IV: 3861
  - hemoglobin composition, III: 3580
  - hypothermia tolerance, IV: 4599
  - muscular function, II: 1137
  - neuromuscular performance, II: 1892
  - neuropsychiatric fitness, III: 3223
  - physical fitness, II: 1298; III: 3272; IV: 4096
  - pilot performance, II: 1822; III: 3110; IV: 4921
  - psychomotor performance, III: 3476
  - reaction time, III: 3163, 3476; IV: 3844, 3869
  - respiration, II: 2091
  - retinal circulation, II: 2096
  - stress tolerance, II: 1145; III: 3026
  - visual accommodation, I: 258
  - visual acuity, II: 2298
  - visual thresholds, II: 1926
  - work capacity, III: 2613

AIMING see Target practice

AIR see Air conditioning; Air purification; Cold air breathing; Gas in body cavities; Respiratory gases. Also see entries under Atmosphere

AIR BLAST see Blast

AIR CONDITIONING see under Airplanes; Cabins; Cockpits; Pressure cabins. Also see Air purification; Temperature control; Ventilation. Also see entries under Regeneration

AIR CREWS (see also Combat crews)

- attitudes, I: 147, 695; II: 1080, 1231, 1722, 2010; III: 2651
- nutrition, I: 35; II: 1083
- performance, I: 471, 473, 540, 624; II: 950, 1038, 1338, 1417, 1558, 1559, 1616, 1722, 2010, 2013; III: 2651; IV: 4779, 5074
  - social factors, IV: 4146
  - test methods, I: 471, 472, 695; II: 1246, 1675
  - tests, II: 2182; III: 2733, 2744, 3688
- rating, IV: 4191
- selection, II: 2011; III: 3380
- training, I: 298, 472; II: 1338, 1602, 1722, 2012; IV: 4824

AIR EVACUATION (see also Air transportation of patients), III: 3546; IV: 4567

- role of flight surgeons, III: 3639
- use of:
  - airplanes, III: 2953; IV: 4985
  - helicopters, I: 8, 16, 72, 302, 490, 528, 541, 580, 626, 897; III: 2311, 2389, 2953, 3520; IV: 4699

AIR EVACUATION (by country)

- Canada, IV: 4652
- French East Africa, IV: 4514
- Honduras, IV: 4569

AIR PRESSURE see Barometric pressure; Intrapulmonary pressure; Pressure cabins

AIR PURIFICATION see Deodorization

AIR SICKNESS see Altitude sickness; Motion sickness

AIR TRAFFIC CONTROL OPERATORS see Traffic control operators

AIR TRANSPORTATION see Air evacuation; Air transportation of patients; Passenger transportation. Also see under Medical personnel

AIR TRANSPORTATION OF PATIENTS (see also Air evacuation; Ambulance helicopters; Ambulance planes), I: 5, 26, 387, 526, 573, 580, 626, 807, 887; II: 1078, 1736, 2016, 2259, 2260; III: 2379, 2654, 3033; IV: 3995, 4260, 4507, 4567, 4922, 4969

- Australia, III: 2379
- Europe, I: 717
- Great Britain, I: 59; IV: 3701, 4930

Korean campaign, I: 8, 54, 72, 95, 96, 528, 541, 723, 786, 897; II: 970

legal aspects, I: 319

medical problems, IV: 4310

safety, I: 25, 519, 739; III: 3658

use of:

helicopters, III: 3313

respirators, II: 2265

World War II, II: 1207

AIR TRANSPORTATION OF PATIENTS (by pathological condition), I: 526, 887; II: 1746; IV: 5022

cardiovascular diseases, I: 303, 387, 704, 785; II: 1600, 1790, 1791, 1792; III: 2315, 3464, 3508; IV: 3872, 4035, 4298, 4888

communicable diseases, I: 319; II: 2008

fever, IV: 4485

gas in body cavities, I: 12, 215, 715; II: 1153

head injuries, I: 215; IV: 4220, 5077

mental diseases, I: 808; III: 2419, 3509; IV: 3854

neck injuries, IV: 4220

poliomyelitis, I: 507; II: 932, 2265; III: 3490; IV: 5177

respiratory diseases, I: 303, 387, 785; II: 1153, 2160; III: 3508; IV: 4888, 5043

sicklemia, III: 2607, 2611, 2670, 2890, 3228; IV: 3798, 4308, 4557, 4974

AIRCRAFT (see also Airplanes; Helicopters; Rockets)

human engineering, I: 3, 123, 203, 281, 508, 515; II: 1569, 2136; IV: 3709, 3882, 4045

AIRCRAFT BRIGHTENERS

toxic effects, I: 229

AIRCRAFT CONTROLS (see also Instrument panels; Pedals)

human engineering, I: 29; II: 1201, 1213, 1214, 1299, 1603, 1762, 1802, 2021, 2072, 2236; III: 2327, 2968, 3387; IV: 3740, 3907, 4275, 4348, 4431, 4672, 4703, 4877

AIRCRAFT DEBRIS

hazards, III: 2837

AIRCRAFT INDUSTRY

role of human engineering, III: 2870, 2949

AIRCRAFT LANDINGS

hazards, IV: 4993

role of motion perception, IV: 4224

training devices, IV: 4961

use of visual cues, IV: 4224

AIRCRAFT NOISE (see also Airplane noise)

analysis, IV: 3982

AIRPLANE CONTROLS see Aircraft controls

AIRPLANE CRASHES see Accidents; Crash injuries

AIRPLANE FLIGHT (see also Diving flight; Flight duty; High altitude flight; High speed flight; Jet plane flight)

cause of:

eye diseases, III: 3300

fatigue, I: 77, 889; III: 3043, 3139, 3156, 3668; IV: 4180

stress, III: 3043

effects on:

blood cells, II: 1461; III: 2678, 2890, 3233

blood pressure, I: 844

cardiovascular system, II: 1306; III: 2306, 3521; IV: 4257

circulation, II: 1743; IV: 4553

ear, IV: 4862

electrocardiogram, II: 1942

epinephrine excretion, III: 2718

hearing, II: 1301, 1302, 1379; III: 3377

labyrinth, II: 1439; III: 2401

paranasal sinuses, II: 1302

respiration, II: 1743; IV: 4553

speech intelligibility, IV: 4359

teeth, IV: 4429

whooping cough, I: 769, 867; IV: 4316

field of vision, II: 926, 1360; III: 3636

general physiological effects, II: 1870, 1942

hazards, II: 2099

medical problems, II: 1113, 1429; III: 2420, 2985, 3079; IV: 3826, 4151, 4260, 5195

nutritional requirements, IV: 4768

pathological effects, IV: 4803

relation to dental disturbances, II: 1788; III: 2571

safety (see also Accidents), I: 577; II: 1071, 1360, 1773, 2272; III: 2314, 2661, 3406; IV: 3987, 4893, 4950

congresses, meetings, and symposia, IV: 4681

sanitary aspects, II: 1357, 2008

AIRPLANE NOISE (see also Engine noise; Jet plane noise), IV: 4842

analysis, II: 1455, 1967, 2019, 2040, 2157; III: 2507, 3283; IV: 4245, 4438

effects on:

hearing, I: 28, 777; II: 1429, 1871; III: 2663, 3009, 3215, 3405; IV: 4496, 4717

speech intelligibility, II: 1108; III: 3308

general physiological effects, IV: 4245, 4246, 4496

general psychological effects, II: 1116, 1358; III: 2507; IV: 4246, 4875

protection, III: 3285

reduction, I: 500; II: 1074, 1116, 1358, 2157; III: 3308; IV: 4245, 4246, 4875

AIRPLANE NOISE (INTERIOR), IV: 3965

analysis, I: 296, 668

reduction, I: 296, 788, 893; II: 1735, 2019; IV: 3924

AIRPLANES (see also Ambulance planes; Training planes; see also parts of airplanes, e.g., Aircraft controls; Cabins)
air conditioning, III: 3459
human engineering, I: 114, 274, 288, 466, 661, 852; II: 1071, 1295, 1544, 1762, 2075, 2136; III: 2870, 2894, 3182, 3406, 3459; IV: 3891, 4159, 4320, 4541, 5074, 5162
kitchen facilities, I: 66, 484; IV: 3770, 4356
sanitary aspects (see also Insects on aircraft, control), I: 313, II: 1773, 1970; IV: 4934, 4942
sanitary facilities, III: 3145; IV: 4595, 4596, 5033
use in air evacuation, III: 2953; IV: 4985
AIRPORTS (see also Landing strips)
hospital facilities, I: 600; II: 1344
human engineering, I: 301; IV: 4045, 4245
sanitary aspects, II: 1970
use of visual signals, III: 2675
ALCOHOL (ETHYL)
effects on:
altitude tolerance, I: 349; IV: 4659
anoxia tolerance, II: 1400; III: 3385; IV: 4659
color vision, II: 2064; IV: 4859
depth perception, I: 242
flicker fusion frequency, III: 3385
neuromuscular performance, III: 3136
pilot performance, I: 804; II: 936; III: 2360
psychomotor performance, IV: 3938
visual perception, I: 242, 339
work capacity, III: 3220
general physiological effects, IV: 3938
general psychological effects, III: 3667; IV: 5190
ALDOSTERONE EXCRETION
effects of heat, IV: 3985
ALERTNESS (see also Vigilance)
effects of:
motion sickness drugs, III: 3062
sleep deprivation, IV: 3954
effects on:
psychomotor performance, IV: 4591
speech intelligibility, III: 2533
measurement, II: 1659
psychological factors, IV: 3885
relation to:
anoxia, II: 1325
electroencephalogram, II: 1659
electromyogram, II: 1659, 2044
ALGAE
photosynthesis, IV: 3793
use as gas exchanger, III: 3236
ALKALOIDS see Aminophylline; Atropine; Caffeine; Cocaine; Codeine; Ergotamine; Hydergine; Mescaline; Morphine; Nicotine; Opium; Physostigmine; Quinine; Scopolamine; Veratrine
ALKALOSIS (see also Hypocapnia)
effects on cerebral circulation, II: 2060
ALPHA-TOCOPHEROL see Vitamin E
ALTIMETERS see Instrument dials
ALTITUDE (see also Anoxia; Bailout at low altitude; High altitude flight)
acclimatization see Altitude acclimatization
cause of:
dental disturbances, I: 48, 871; IV: 4017, 4429
hypocapnia, I: 898
effects on:
adrenal glands, I: 227, 539; III: 3022
alveolar carbon dioxide tension, I: 898, 899
appetite, III: 3178; IV: 4254
arthritis, I: 521
asthma, III: 3269
autonomic nervous system, II: 1518
blood, I: 355, 452, 625, 828, 899; II: 1169; III: 3370, 3545
blood catalase content, III: 3197
blood cells, I: 348, 419, 448, 733, 791, 865; II: 1741, 2006, 2215; III: 2527, 3022; IV: 4781, 4801
blood cholinesterase content, IV: 4491
blood coagulation, IV: 3950
blood lipase content, IV: 4542
blood phosphate content, IV: 4610
blood plasma, I: 539, 554, 731, 761, 854; II: 1392
blood plasma volume, III: 2705
blood potassium content, IV: 4817
blood pressure, II: 1169; IV: 4464
blood sugar, III: 3218
blood volume, III: 2705, 2706, 3544
body temperature rhythm, IV: 5172
bone marrow, III: 2986
brain activity, I: 681; II: 1677; III: 3021, 3523
central nervous system, IV: 4325
circulation, I: 290, 381, 527, 621; II: 1456, 1518, 1546, 1790, 1791, 1792, 2151; III: 2634, 2896; IV: 3942, 4509
cerebral circulation, I: 223
cutaneous circulation, III: 2986
conditioned reflexes, III: 3355
dark adaptation, II: 1963
digestive system function, I: 267, 513, 798, 799; II: 1265, 2092; IV: 5004

drug action, I: 863; II: 953; III: 3106; IV: 4696
electrocardiogram, IV: 3805
embryonic development, I: 512
endocrine system, I: 345; III: 3411
fertility, I: 11
flatus, I: 797, 799
heart, III: 3447
heart function, II: 1944
hematopoiesis, II: 999; III: 2367, 2473
heterophoria, I: 640
immunity to infectious diseases, II: 1538, 2106; IV: 4352, 5107
insects, II: 1907; IV: 4744
kidney, II: 1169
kidney function, I: 625; II: 1392
liver, III: 3437
lung, II: 1169
metabolism, III: 3080, 3543; IV: 4632
metabolism of organs:
liver, I: 362
tissues, III: 2467
metabolism of substances:
carbohydrates, I: 362
potassium, II: 2206
proteins, II: 1794
sodium, II: 2206
middle ear, I: 48
muscle tissue, I: 257
nervous system activity, IV: 3942, 4509
neuromuscular performance, II: 1892
nitrogen elimination, II: 1756
ocular rhythms, IV: 5172
pneumothorax, I: 12, 715; II: 1153
pulse rate, I: 591
reaction time, III: 3539
respiration, I: 451, 726; II: 1523; III: 2618, 2652, 2727, 2872, 2873, 3370, 3523, 3543; IV: 3943
reticulo-endothelial system, IV: 5107
speech intelligibility, I: 104; III: 3248
temperature regulation, I: 345
tissue composition, I: 278
toxicity of poisons, II: 953
visual accommodation, IV: 3904
water exchange, II: 1938, 2206
work capacity, III: 3604
X-ray tolerance, I: 791; II: 2117
general physiological effects, II: 1429, 1562, 1841, 2006, 2107, 2223, 2286; III: 2802, 3214, 3678, 3680; IV: 4206, 4295, 4515, 4623, 4907, 5187, 5194
general psychological effects, IV: 4151, 4623
nutritional requirements, IV: 4856
pathological effects, IV: 3993
relation to heart abnormalities, I: 291; III: 2369; IV: 4614
research centers, I: 266; IV: 4255
tolerance see Altitude tolerance

ALTITUDE ACCLIMATIZATION (see also Inhabitants of mountains), IV: 4663, 4704, 4857
effects on:
altitude tolerance, II: 2107, 2264, 2286; III: 2518, 2794, 3185, 3680, IV: 4377, 5194
anoxia tolerance, IV: 4239, 4598
blood, I: 827; III: 3401
blood cells, I: 356, 557, 826; II: 2207; III: 2473, 2527, 2696, 3342, 3364, 3569; IV: 4781
blood pressure, III: 3131
blood sugar, II: 1263
blood vessels, III: 3294; IV: 3803
body fat, III: 3478
brain activity, I: 681; III: 3021
carbon monoxide tolerance, III: 3657
circulation, II: 1055, 1057, 1838; III: 3294; IV: 4662
cold tolerance, III: 2756
electrocardiogram, IV: 3723
fertility, IV: 4663
heart, I: 291; III: 3400; IV: 3804, 4880, 4881, 5053
hemoglobin composition, III: 3581
immunity to infectious diseases, I: 148, 149, 150; III: 2476; IV: 3830, 3831
kidney function, II: 974
liver, I: 237
malaria, IV: 5143
metabolism, III: 3574; IV: 3976, 4633
metabolism of organs:
brain, II: 966, 968, 1321
tissues, II: 1241; III: 2593
metabolism of substances:
citrates, IV: 3830
iron, II: 2223
lactic acid, IV: 3830
potassium, II: 2206
sodium, II: 2206
muscular system, I: 257
myoglobin, I: 257; IV: 4013, 5109
nervous system activity, III: 2823
nuclear radiation tolerance, IV: 3775
psychomotor performance, III: 2794
pulse rate, III: 3131

reflexes, II: 1782
respiration, II: 1055, 1057, 1416, 1980, 1981, 2165; III: 2380, 2405, 2554, 2580, 3179; IV: 4780
retinal blood vessels, I: 680
temperature regulation, II: 1411; III: 3179
urine composition, II: 974; III: 3415, 3569
water exchange, II: 1938, 2206; III: 3478
work capacity, III: 2874, 3604
general physiological effects, I: 88, 479, 586, 861, 862; II: 988, 1036, 1275, 1782, 1931, 2223; III: 2681, 3214, 3216, 3374, 3678; IV: 4255, 4388, 4389, 5130
pathological effects, I: 237, 583; IV: 4389
relation to diet, IV: 4254
research, I: 10, 64; IV: 4255
role of:
adrenal glands, I: 491; II: 1411
brain, II: 1931
thyroid gland, I: 866
test methods, III: 2939, 3131

ALTITUDE CHAMBERS see Decompression chambers

ALTITUDE SICKNESS (see also Decompression sickness), I: 84; II: 1562, 2006; III: 3214, 3523; IV: 4015, 4389, 4544, 4668, 4857
prevention and treatment, II: 2107, 2200; III: 2924, 3643; IV: 3777, 4295

ALTITUDE SUITS (see also Space suits), I: 51, 55, 71, 476, 477, 504, 506, 533, 643; II: 922, 1107, 1656, 2249; III: 2312, 2567, 3189, 3354; IV: 3984, 4336, 4723, 4753, 5181
evaluation, I: 857; II: 1191, 1562; III: 2774; IV: 4547

ALTITUDE TOLERANCE, I: 122, 205, 349, 421, 422, 450, 453, 509, 889; II: 2264; III: 3354, 3436, 3678
effects of:
altitude acclimatization, II: 2107, 2264, 2286; III: 2518, 2794, 3185, 3680; IV: 4377, 5194
blood oxygen tension, IV: 4704
carbon dioxide, II: 1522
cold, I: 421, 422; III: 2756
cold acclimatization, III: 2755
diet, III: 2629
drugs, I: 122
alcohol, I: 349; IV: 4659
Dibenamine, I: 122
dihexyverine, IV: 4176
hypnotics, IV: 4436
primaquine, III: 2583, 2584
sulfonamide compounds, IV: 4683
tetraethyl pyrophosphate, I: 122
thiamine, I: 349
vitamin E, III: 3411, 3541
environmental temperature, I: 122
nutrition, IV: 4012
oxygen breathing, I: 381, 621; III: 3185, 3341
respiration, IV: 4377
X-rays, I: 536; IV: 4477
of insects, IV: 4743
relation to:
age, IV: 4164
pH, IV: 4780
iron metabolism, III: 2629
polycythemia, IV: 4622
pulse rate, II: 2286; III: 3680; IV: 5194
role of spleen, IV: 4034

ALVEOLAR CARBON DIOXIDE TENSION, II: 1044, 1259, 1322; III: 2541
effects of:
altitude, I: 898, 899
anoxia, II: 2130
carbon dioxide, II: 2143
explosive decompression, II: 2130
physical work, II: 1035, 1686
speaking, I: 455
voluntary apnea, IV: 5193
effects on:
heart function, II: 1154
respiration, II: 1035; III: 2626
measurement, II: 1334, 1507; III: 3261, 3348

ALVEOLAR OXYGEN TENSION, II: 1044, 1045, 1259, 1322
effects of:
anoxia, II: 2130
explosive decompression, II: 2130; III: 2515
oxygen breathing, III: 3128
voluntary apnea, IV: 5193
measurement, II: 1334, 1507; III: 3348
relation to blood oxygen tension, II: 2269; III: 2753

AMBULANCE HELICOPTERS, I: 16, 73; III: 2908, 3313, 3520

AMBULANCE PLANES
equipment, I: 26, 519, 715; III: 2326
Great Britain, III: 3487
Spain, III: 2746

AMEBIASIS see Intestinal diseases

AMINO ACIDS
effects on fatigue, III: 3213

AMINOPHYLLINE
effects of respiration, IV: 5026

AMINOPYRINE (Pyramidon)
effects on anoxia tolerance, II: 1400

AMPHETAMINE AND DERIVATIVES (Benzedrine, Dexedrine)
effects on:

fatigue, II: 1915; IV: 4323, 4757, 4758, 4760
pilot performance, I: 353, 804
psychomotor performance, I: 353, 804; II: 1549, 1915
general physiological effects, II: 1227, 1228
general psychological effects, I: 38
use in motion sickness, II: 1223

AMYL NITRITE see Nitrites

ANALEPTICS see Amphetamine; Drugs

ANALGESICS see Acetylsalicylic acid; Codeine; Meperidine; Methadone; Morphine, Opium

ANALYSIS see Job analysis. Also see under conditions analyzed, e.g., Accidents, analysis

ANALYSORS
physiology, II: 1837, 1898, 1939, 2079, 2112; III: 3488

ANATOMY see under Auditory cortex; Ear

ANDROSTERONE
effects on fatigue, IV: 4879

ANEMIA see Blood loss

ANESTHESIA
effects on cold tolerance, III: 2448

ANESTHETICS (see also names of specific anesthetics, e.g., Barbituric acid derivatives)
effects on:
anoxia tolerance, IV: 5120
blood pressure, I: 196
respiration, II: 1276

ANGULAR ACCELERATION see Rotation

ANIMAL CONTAINERS (SEALED), II: 1712; III: 3071, 3234

ANIMAL EXPERIMENTS see under Anoxia tolerance; Artificial respiration; Balloon flight; Decompression chambers; Hypercapnia; Hypothermia; Space flight, medical problems; Temperature regulation. Also see Hibernators

ANOREXIA see Appetite

ANOXEMIA see Anoxia

ANOXIA (see also Altitude; Asphyxia)
cause of:
apnea, I: 321, 608; III: 2489; IV: 3841, 3842, 5031
hyperventilation, I: 166, 451
effects on:
action potentials of spinal cord, IV: 4202
adrenal glands, I: 611, 614; II: 1582; III: 2527, 2936; IV: 5041, 5108
alveolar carbon dioxide tension, II: 2130
alveolar oxygen tension, II: 2130
auditory fatigue, IV: 4409
autonomic nervous system, II: 1689
behavior, III: 2506
blood, I: 98, 256, 545, 630; II: 994, 1045, 1392, 1421, 1783; III: 2398, 2937; IV: 4903
blood catalase content, III: 2801
blood cells, I: 306; II: 988, 1479, 1481, 1699, 2207; III: 2368; IV: 5050
blood coagulation, IV: 4465
blood lipid content, IV: 4465
blood pH, IV: 5050
blood plasma, IV: 4601
blood pressure, II: 1476; III: 2825, 3238; IV: 4889
blood sugar, III: 3691
blood vessels, II: 1689
retinal blood vessels, I: 680
body fluids, II: 994; III: 2398
body temperature, I: 194, 195; IV: 3949, 4794, 4795, 4796
body weight, III: 3397
bone, II: 1421
brain, I: 584; II: 2066; III: 2459, 3091, 3099; IV: 5068
brain activity, I: 388, 401, 587, 609; II: 981, 1065, 1147, 1328, 1677, 1836, 2283; IV: 5183
central nervous system, III: 2509
cerebrospinal fluid pH, III: 2809
chemoreceptors, III: 2406
circulation, I: 128, 194, 195, 386, 569, 803; II: 1055, 1056, 1147, 1601, 2129; III: 2822, 2962, 3083, 3237, 3435, 3444; IV: 4692, 4693, 5111, 5116
cerebral circulation, IV: 4645
pulmonary circulation, I: 106, 107, 128, 129, 304, 568, 569; II: 1339, 1340, 1471, 1526, 1979, 2053, 2144, 2145; III: 2413, 2621, 2904, 3240, 3466, 3511, 3647; IV: 4001, 4150, 4328, 4528, 4954
renal circulation, II: 1101, 1102
retinal circulation, I: 502; II: 1693
cochlea, I: 558
digestive system function, II: 1386, 1982, 1983
drug action, I: 108, 275, 863; II: 1815; III: 2628
electrical potentials of cochlea, I: 896; II: 1118, 2275; III: 2805; IV: 4025, 5070
electroencephalogram, I: 282, 413, 821, 823, 906; II: 1591, 2120, 2121, 2279; III: 2469, 2505, 2976, 3335; IV: 4011, 4749
electroretinogram, II: 2112; IV: 4749
heart, III: 2937, 3011; IV: 5108
myocardiac tissue, I: 565; II: 1718
heart function, II: 1717; III: 3027, 3524, 3526; IV: 3750, 4444
ballistocardiogram, II: 1801
electrocardiogram, I: 884; II: 981, 1945, 2283; III: 2344, 2505, 2508, 2818, 3381; IV: 3699, 4059, 4237, 4238, 4288
pulse rate, II: 1644, 1945; III: 2819, 2936; IV: 4059
hematopoiesis, III: 2814

hyperthermia, IV: 4485
hypophysis, IV: 5041
interoceptors, II: 965
intracranial pressure, I: 405; II: 1476
kidney function, I: 108, 109, 771; II: 974, 1392, 2076, 2205; IV: 3697, 4031, 4032
liver, III: 2936
lung, I: 404, 470; II: 1264, 1432; III: 2622
lymph flow, III: 3028
memory, III: 2506; IV: 5068
mental performance, I: 164, 167; III: 2486, 2487; IV: 4688, 5024
metabolism, I: 469, 565; II: 1036
  endogenous formation of carbon monoxide, II: 1784; III: 2481
  oxygen consumption, I: 187, 469, 565; II: 988, 1036; III: 3289; IV: 4692, 4794, 4795
metabolism of organs:
  bone marrow, II: 1984, 1985; IV: 4903
  brain, II: 967, 969, 971, 1321, 1909, 1910, 2085, 2111; III: 2956, 3549; IV: 5056
  heart, I: 565; II: 1261, 1262, 1266, 1267; III: 2362, 2508, 2866, 3525
  liver, IV: 3794, 4489
  muscles, II: 1793, 2097; III: 3577; IV: 5104
  spleen, II: 1984, 1985
metabolism of substances:
  carbohydrates, II: 1261, 1262, 1266, 1267, 1909; IV: 3996, 4489
  electrolyte distribution, IV: 4736
  glutamine, II: 2097
  iron, IV: 4903
  ketones, II: 1681
  lactic acid, III: 3577; IV: 5104
  lipids, III: 3049
  nucleic acid, II: 1984, 1985
  phosphorus, II: 1496, 1793, 2111
  potassium, II: 1266; IV: 4601, 4602
  sodium, III: 2742
milk composition, II: 1478, 1480; IV: 4253
muscular function, I: 492, 854
muscular system, I: 386, 492
nerves, III: 3011
neuromuscular performance, II: 1009, 1677
neuromuscular reactions, III: 2505
nuclear radiation tolerance, IV: 3776
performance of aviators, II: 1113
psychomotor performance, II: 1186, 1835; IV: 4239, 5024
pupil size, I: 312
reasoning, III: 3133, 3134
reflexes, II: 1782, 2300; III: 2962; IV: 4814
  carotid sinus reflexes, II: 1345
  conditioned reflexes, I: 609, 612; II: 1835, 1836, 1933; III: 2388, 3355
reproductive system, II: 1678
respiration, I: 101, 128, 165, 304, 321, 401, 404, 456, 469, 470, 568, 608, 630, 672, 726, 803; II: 1055, 1056, 1057, 1098, 1143, 1147, 1476, 1839, 1979, 2091, 2129, 2283; III: 2388, 2488, 2587, 2753, 2820, 2962, 3127, 3289, 3371, 3395, 3597; IV: 3997, 4059, 4560, 4574, 5111, 5116
results of personality tests, IV: 4688
sensory perception:
  auditory perception, II: 2179; III: 2729; IV: 4409
  brightness discrimination, I: 245
  color vision, I: 175; II: 2064; III: 2963
  dark adaptation, I: 141
  depth perception, I: 242; II: 1661; IV: 3929
  flicker fusion frequency, III: 2480, 3385
  retinal adaptation, I: 243, 247
  visual perception, I: 192, 312, 339; II: 1088, 1089, 1393, 1941; III: 3413
spatial orientation, III: 2821; IV: 4831
spinal cord, III: 3099
spleen, IV: 4418
standing potential, I: 217
temperature regulation, I: 194, 195, 468
thrombocytes, IV: 4465
tissue fluid distribution, II: 1718
urine composition, II: 974; IV: 4980, 4981, 4982
uterus, I: 859
work capacity, II: 1032; III: 3109
X-ray tolerance, II: 1913; III: 3352
general physiological effects, I: 396, 421, 570, 860; II: 938, 988, 1138, 1421, 1782, 1932, 1933; III: 2871, 3024, 3500
  test methods, IV: 4962
general physiological factors, II: 1799; III: 3267, 3500
general psychological effects, III: 3667; IV: 4347, 5190
relation to:
  alertness, II: 1325
  fatigue, II: 1325
  sleep, II: 1325
resuscitation, III: 2830, 2956; IV: 3841, 5031
role of:
  adrenal glands, I: 491, 539, 611, 614; IV: 4693
  autonomic nervous system, II: 1479, 1481, 1983
  hypophysis, I: 614; II: 2207
  thymus, I: 491; III: 2936
terminology, III: 3514

tolerance see Anoxia tolerance
treatment, I: 400, 570; II: 942, 1933; III: 3500
warning devices, I: 217, 450, 545; III: 2373, 2703; IV: 3773, 4647

ANOXIA ACCLIMATIZATION see Altitude acclimatization

ANOXIA TOLERANCE, I: 205; II: 1517
animal experiments, III: 2850, 2962
effects of:
altitude acclimatization, IV: 4239, 4598
blood loss, II: 1252
cold, II: 1972
drugs, I: 608, 821, 823; II: 1400; III: 2488
adrenocorticotropic hormone, II: 2121; IV: 4598
alcohol, II: 1400; III: 3385; IV: 4659
aminopyrine, II: 1400
anesthetics, IV: 5120
antihistaminics, I: 165; II: 993, 1099; IV: 4492
barbituric acid derivatives, II: 1400
Centropnein, I: 821, 823; III: 3349
chlorophyll, II: 1400
chlorpromazine, II: 1221; III: 3349; IV: 4029
cobalt compounds, IV: 5154
cortisone, III: 3528; IV: 3743
Diamox, IV: 3933
Dibenamine, I: 321
dimenhydrinate, I: 821, 823; III: 3350
diphenylhydantoin, II: 1400
ergotamine, II: 1400
folic acid, III: 2647
glucose, I: 821, 823
glycyrrhizin, IV: 4309
histamine, III: 2775; IV: 3762
methenamine, IV: 3762
Metrazol, II: 1400
morphine, III: 3529
nikethamide, II: 1400
pilocarpine, I: 608
procaine, I: 398
purine, III: 2647
pyridine, III: 2647
vasopressin, I: 608
vitamin E, III: 2469, 2817, 2818, 2819
environmental temperature, I: 122; II: 1307, 1520
heat acclimatization, IV: 4350
hypocapnia, III: 3051
hypothermia, III: 2850
starvation, II: 1873; III: 3251
X-rays, I: 536; II: 1668, 1873; III: 3251
evolutionary aspects, II: 2108
psychological factors, III: 3596
relation to:
age, II: 1626
body temperature, II: 1400; III: 3230
carbohydrate metabolism, III: 3191
hemoglobin composition, IV: 4308
phosphorus metabolism, III: 2776
polycythemia, III: 3582
renal circulation, II: 1102
role of:
adrenal glands, III: 2937, 3239
autonomic nervous system, III: 3239
blood sugar, III: 3051
central nervous system, II: 2086
chemoreceptors, II: 1221
spleen, IV: 4344

ANTIBIOTICS see Terramycin

ANTIBODIES
effects of hypothermia, IV: 3797

ANTICHOLINESTERASE
effects on nystagmus, III: 3241

ANTI-G DEVICES, IV: 3881, 4719, 5173

ANTI-G PROCEDURES (Crouching, Straining, Valsalva maneuver), I: 902; IV: 4531

ANTI-G SUITS (see also Space suits), I: 51; III: 2312; IV: 4205, 4719, 5181
effects on:
ballistocardiogram, IV: 5049
positive acceleration tolerance, IV: 4531
respiration, IV: 5049
evaluation, I: 902; II: 1749, 1829; III: 2599, 3468; IV: 3808, 4533

ANTI-G VALVES, II: 2150; III: 2453, 3517

ANTIHISTAMINICS (see also Antistine; Benadryl; Cyclisine; Dimenhydrinate; Promethazine)
administration, II: 1438
effects on:
anoxia tolerance, I: 165; II: 993, 1099; IV: 4492
circulation, IV: 5167
congestion of nasal passages, II: 1438
electroencephalogram, IV: 4716
hyperoxia tolerance, IV: 4281
nystagmus, III: 3373
respiration, I: 165; II: 993, 1098, 1099
sedative effects, IV: 4716
use in motion sickness, II: 1372, 1509

ANTISTINE
use in motion sickness, I: 142

ANXIETY (see also Claustrophobia; Mental stress), I: 496
caused by:
acceleration, II: 1474

blast, II: 1859
flight duty, I: 21, 41, 767; II: 1435; III: 2719, 2763, 2781, 2782, 3092, 3593, 3595; IV: 5125
jet plane piloting, IV: 3799
stress, IV: 3791
effects of rest, II: 1097
effects on:
auditory perception, III: 3470
behavior, IV: 4661
circulation, II: 1691
equilibrium, II: 1609
finger tremor, II: 1991
flicker fusion frequency, II: 1609; III: 3394
learning, II: 1292, 2163; III: 3159; IV: 4661
mental performance, II: 1647; III: 3159
neuromuscular performance, III: 3394
perspiration, II: 1766, 1767
psychomotor performance, I: 718; III: 2642, 3159; IV: 4276, 4603
reaction time, IV: 4276
reasoning, II: 1761
visual perception, III: 3470
general physiological effects, IV: 4813
general physiological factors, II: 1719
psychological factors, II: 1437, 1719; III: 3664
relation to:
mental ability, IV: 4453
personality, II: 1632
test methods, IV: 4453
treatment, II: 1437; III: 2782
ANXIETY PRONENESS, I: 496
relation to:
electroencephalogram, I: 853; II: 2204
hippuric acid metabolism, II: 1053
test methods, I: 168, 853; II: 1459, 1557, 2203, 2204; III: 2372, 2807, 3572, 3573; IV: 4437, 4568, 5124, 5125, 5155
tests, II: 2202
APNEA
caused by:
anoxia, I: 321, 608; III: 2489; IV: 3841, 3842, 5031
hyperventilation, III: 2653; IV: 4071
time factors, III: 2872, 2873
pressure breathing, IV: 5160
effects on:
action potentials of phrenic nerve, IV: 4071
circulation, IV: 4173
kidney function, IV: 4173
general physiological effects, III: 3635
time factors, IV: 3842
APNEA (VOLUNTARY)
effects of:
acidosis, III: 3510
hypercapnia, II: 1100
hyperoxia, II: 1100
hyperventilation, II: 1100
physical work, IV: 5163
effects on:
alveolar carbon dioxide tension, IV: 5193
alveolar oxygen tension, IV: 5193
blood carbon dioxide tension, II: 1418
blood oxygen tension, I: 403, 544, 705; II: 1418, 1943; IV: 4137
circulation, I: 705; II: 1943
pulse rate, I: 705; II: 1943; III: 3515
respiratory gases, II: 1100
tests see Apnea test
time factors, II: 1418; IV: 5193
APNEA TEST, II: 1976
APOMORPHINE see Morphine and derivatives
APPETITE
effects of altitude, III: 3178; IV: 4254
APTITUDE TESTS, I: 49, 272, 347, 389, 390, 391, 394, 594, 604, 690, 708, 833, 841, 842, 912, 915; II: 1007, 1197, 1277, 1336, 141[illegible] 1415, 1595, 1618, 1716, 1780, 1947, 207[illegible] 2189, 2190, 2191, 2194, 2197, 2290, 229[illegible] 2294, 2295, 2296; III: 2816, 2867, 3101, 3297; IV: 4386, 5067
analysis, II: 1059, 1469, 2018, 2292, 2293; III: 242[illegible] 2668, 2764, 2854, 2926
ARAMINE
effects on circulation, IV: 4898
ARCTIC see under Rescue; Survival
ARCTIC AEROMEDICAL LABORATORY, I: 268
ARM MOVEMENTS
effects of positive acceleration, II: 1206
ARTERENOL see Epinephrine
ARTERIAL PRESSURE see Blood pressure
ARTERIOSCLEROSIS
relation to age, I: 678
ARTHRITIS
effects of:
altitude, I: 521
barometric pressure, I: 521
ARTIFICIAL HIBERNATION see Hypothermia
ARTIFICIAL RESPIRATION (see also Electrophre[illegible] respiration; Pressure breathing; Respirators; Re[illegible] citation), II: 1355, 1576, 2122, 2155
animal experiments, III: 3686

effects on:
blood, II: 1578
circulation, III: 3158
ASCORBIC ACID (Vitamin C)
effects on:
adrenal glands, IV: 4085
cold acclimatization, IV: 4048
cold tolerance, III: 2512, 2688, 2689, 2747, 2991, 3070, 3642; IV: 3862
dark adaptation, II: 1458
liver metabolism, III: 2658
oxygen consumption, III: 2658
in adrenal glands, II: 1012; III: 2417
ASCORBIC ACID METABOLISM
effects of:
cold, II: 1842; III: 2689, 2995; IV: 4049
hormones, IV: 4664
hyperoxia, IV: 4214
stress, IV: 4664
role of thyroid gland, III: 3193
ASPHYXIA (see also Anoxia), II: 1433
ASPIRIN see Acetylsalicylic acid
ASTHMA
effects of altitude, III: 3269
ASTRAGALUS INJURIES see Leg injuries
ATHEROSCLEROSIS see Arteriosclerosis
ATMOSPHERE see under Helicopter cabins; Mars. Also see Planetary atmospheres; Space cabin atmospheres; Upper atmosphere
ATMOSPHERIC PRESSURE see Altitude; Barometric pressure
ATOMIC EXPLOSIONS
effects on visual perception, I: 886
ATROPINE AND DERIVATIVES
administration, II: 1612
effects on:
electrocardiogram, I: 392
salivary glands, II: 1612
use in motion sickness, IV: 4715
vasoconstrictor effects, I: 566
ATTENTION see Alertness
ATTITUDES (see also under the various personnel categories, e.g., Officers, attitudes. See also Behavior; Motivation)
test methods, IV: 4185
ATTRITION see under Personnel, training; Pilots; Pilots, training
AUDIOMETRY see Hearing, test methods
AUDITORY ADAPTATION (see also Tympanic muscle reflexes), I: 917; II: 1174, 1540, 1650, 1701; IV: 4098, 4415, 5156, 5158, 5159
AUDITORY CANAL see External ear
AUDITORY CORTEX
anatomy, IV: 4284, 4701
physiology, IV: 4284, 4701
AUDITORY CUES
effects on speech intelligibility, IV: 4561
AUDITORY FATIGUE, I: 292, 360, 488, 489, 663, 728, 729, 777, 917; II: 941, 1301, 1536, 1537, 1540, 1541, 1650, 1704, 1868, 1871, 1934, 1990, 2178, 2179; III: 2886, 2932, 3094, 3196, 3420; IV: 3934, 4099, 4101, 4537, 4538, 5059
caused by jet plane noise (interior), III: 2665
effects of:
anoxia, IV: 4409
auditory stimuli, III: 3196
relation to deafness, IV: 4140
test methods, IV: 4539
tests, IV: 4360
time factors, IV: 4413, 4414
AUDITORY FLUTTER, II: 1950
AUDITORY HABITUATION, IV: 4345
AUDITORY NERVE
action potentials, I: 917
AUDITORY PERCEPTION (see also Auditory adaptation; Auditory fatigue; Auditory flutter; Loudness discrimination; Pitch discrimination), I: 542, 721, 722
effects of:
anoxia, II: 2179; III: 2729; IV: 4409
anxiety, III: 3470
barometric pressure, I: 669
binaural hearing, III: 2482; IV: 3838
dimenhydrinate, II: 1389; III: 3661
ear pressure gradient, IV: 4312
earphones, IV: 5205
jaw movements, II: 1420
light stimuli, II: 1489; IV: 4884
monaural hearing, III: 2482; IV: 3838
noise, II: 1003, 1110, 1301, 1536, 1868, 2178, 2179; IV: 4099, 4538, 4708
rotation, II: 1837
side-tone, III: 3648
sound, II: 1540, 1541; III: 2886; IV: 4415
speaking, IV: 3754
starvation, II: 1663; IV: 3903
general physiological factors, III: 2912; IV: 4339
of partially deaf, I: 462, 837
psychological factors, III: 2912; IV: 4339
relation to:
bone conduction, I: 918; II: 1317, 1420, 1454, 1542, 2303; III: 2496
pain, III: 2788

research, II: 1969

research centers, IV: 4832

tests, II: 1950

thresholds, I: 669, 917; II: 1730, 1912

time factors, IV: 5153

AUDITORY SIGNALS (see also Warning devices (Acoustical))

effects on:

psychomotor performance, IV: 4844

reaction time, II: 2123

intelligibility, I: 189; II: 1151, 1178, 1336, 1959, 1960, 1961; III: 2536, 2555

effects of:

noise, II: 940

visual stimuli, II: 1856

use in piloting, IV: 4092

AUDITORY STIMULI (see also Auditory signals; Noise)

cause of deafness, III: 2364

effects on:

auditory fatigue, III: 3196

electroencephalogram, III: 3199

intelligibility of visual signals, II: 1856

psychomotor performance, IV: 4375

sound localization, II: 995

visual acuity, IV: 4884

visual illusions, II: 2119

general physiological effects, IV: 4026

idiophonic effect, I: 343

intensity

effects on reaction time, III: 2994

AUDITORY TUBE see Eustachian tube

AUSTRALIA see under Air transportation of patients; Aviation medicine; Flight surgeons

AUSTRIA see under Psychomotor performance, research

AUTOKINETIC PHENOMENON see Visual illusions

AUTOMATIC PILOT see Instrument flight; Instrument guidance systems

AUTONOMIC NERVOUS ACTIVITY RHYTHM

effects of stress, IV: 4242

relation to diurnal cycle, IV: 4242

AUTONOMIC NERVOUS SYSTEM (Parasympathetic nervous system; Sympathetic nervous system)

effects of:

altitude, II: 1518

anoxia, II: 1689

blast, II: 2050

hyperoxia, II: 2057

hyperthermia, IV: 4207

hypothermia, IV: 4207

rotation, II: 1666

examination, I: 564

relation to motion sickness, I: 738

role in:

anoxia, II: 1479, 1481, 1983

anoxia tolerance, III: 3239

circulation, II: 1546

hematopoiesis, II: 1904, 1905

hyperoxia tolerance, III: 2845

potassium metabolism, IV: 4602

AVIATION CADETS see Trainees

AVIATION CASUALTIES (see also Accidents; Crash injuries)

identification (see also subdivision Post-mortem findings), I: 698; III: 2749; IV: 4393

World War II, II: 1383, 1483

AVIATION DENTISTRY see Dental care; Dental disturbances

AVIATION GASOLINE see Gasoline

AVIATION MEDICAL ACCELERATION LAB., JOHNSVILLE, PA., IV: 3759

AVIATION MEDICINE (see also Aviation psychology; Dental service; Military medicine; Space medicine), I: 100, 531, 559, 636, 678, 805, 811; II: 934, 1707, 1744; III: 2838, 3186, 3353, 3671; IV: 4078, 4543, 5127

administrative and organizational aspects, II: 1773; III: 2734; IV: 4378, 4384, 4634, 4790, 4791, 4825

bibliography, IV: 4241

congresses, meetings, and symposia, II: 1270, 1571; III: 2833

handbooks and treatises, I: 97; II: 955, 1858; III: 2345, 2793, 2857, 3293; IV: 3807, 3926, 4908

history, I: 315, 598, 679; II: 934, 1430, 1508, 1621, 1923, 2270; III: 2667, 2980; IV: 3819, 3830, 4196, 4451, 4558, 4600, 4849, 5020, 5096

World War II, IV: 5166

relation to psychosomatic medicine, IV: 4991

research, I: 6, 19, 748; II: 937, 1180, 1434, 1499, 1583, 1708; III: 2844, 2980; IV: 3759, 4165, 4732, 5013, 5034

bibliography, II: 1867

use of electronic equipment, IV: 4905

research centers (see also Aeromedical Laboratory; Aviation Medical Acceleration Lab., Johnsville, Pa.; School of Aviation Medicine (U. S. Air Force; School of Aviation Medicine (U. S. Navy), IV: 4823

research methods, IV: 4759

schools see School of Aviation Medicine (U. S. Air Force); School of Aviation Medicine (U. S. Navy)

societies, I: 1, 50; IV: 3819

AVIATION MEDICINE (by country)
Australia, II: 1260; III: 2636
Belgium, I: 283; II: 1377
Brazil, I: 637; II: 998, 1508
Canada, II: 2240, 2271; III: 2316
Denmark, III: 3486
France, I: 702; IV: 3947
French West Africa, I: 563
Germany, IV: 4885
Great Britain, II: 1260
India, III: 3463
Indochina, I: 182, 665
Italy, II: 920; III: 3108, 3319
Netherlands, III: 3666
Sweden, I: 102; II: 1312, 1757; III: 2322, 2494, 3455
Switzerland, II: 2001, 2261; III: 3645
Thailand, III: 3345
United States, I: 639; II: 937, 1180, 1499, 1899; III: 2390, 2992; IV: 4451, 4698, 4733, 4825
AVIATION PERSONNEL see Personnel
AVIATION PSYCHOLOGY, II: 1621; III: 2789, 3281; IV: 4277, 4278
AVIATORS (see also Aerial gunners; Air crews; Bombardiers; Navigators; Pilots; Space crews)
age factors, I: 644, 645, 684; II: 1313, 1483, 1824, 1906
attitudes, I: 592; II: 1017, 1020, 1022, 1023; III: 2370, 3596, 3608, 3617, 3664
test methods, II: 1011
classification, I: 272; II: 2073, 2194, 2196; III: 2854
testing conditions, II: 1711
contraindication of drugs, III: 2831; IV: 4248
quinine, IV: 4289
hearing requirements, III: 3055; IV: 4500, 4654
incidence of:
intestinal diseases, IV: 3720
malaria, IV: 3720
peptic ulcer, IV: 4131, 4556
tuberculosis, IV: 4131
life expectancy, I: 685; IV: 4593
medical histories, II: 1483, 1906
morale, II: 1588
test methods, III: 3069, 3610
neuropsychiatric fitness, III: 3157, 3319, 3595
nutrition, IV: 4434
occupational deafness, I: 292, 777; II: 997, 1301, 2042; III: 3009, 3052, 3405; IV: 3719, 4495, 4862, 5170
follow-up studies, IV: 4886
occupational diseases, II: 2047; III: 3377; IV: 3719
occupational hazards, III: 3221
performance, II: 1038, 1589; III: 2945, 3608
effects of:
anoxia, II: 1113
diseases, III: 3607
stress, I: 33; II: 1113; IV: 5011
relation to age, II: 2093
test methods, II: 1824
personality, II: 1587, 1632, 2280; III: 3072, 3389, 3614
physical fitness, II: 1077, 1138; III: 2843; IV: 3947, 4813
rating, II: 1231, 1327, 1648; III: 2946, 3329, 3612, 3614; IV: 5137
selection, I: 31, 137, 140, 403, 774, 822, 905; II: 1007, 1022, 1138, 1236, 1378, 1557, 1588, 1610, 1618, 1762, 1773, 1870, 1899, 1946, 1976, 2078, 2181, 2268, 2293; III: 2521, 2668, 2827, 2867, 3187, 3188, 3319, 3530, 3565; IV: 4162, 4163, 4168, 4243
testing conditions, III: 3609
training, I: 335; II: 924, 927, 1017, 1020, 1327, 1377, 1394, 1588, 1590, 1625, 1762, 1773, 2118; III: 2321, 2370, 3190, 3548, 3608, 3617; IV: 3932, 3981, 4243, 4753, 4790, 4791
handbooks and treatises, IV: 4908
prediction of success, II: 1589, 1625, 2287; III: 2422, 2744, 3102; IV: 4549, 4697
visual requirements, IV: 4188
vocational interest, II: 1022, 1028, 1029, 2026, 2181
BACTERIA see Escherichia coli; Microorganisms; Pseudomonas; Salmonella
BAILOUT (see also Ejection seats; Escape capsules Free fall; Parachute jumping), I: 90, 241, 633, 744, 809, 892; III: 2909, 3225, 3314; IV: 5100
at high altitude, I: 359, 435, 476, 634; II: 1514 III: 2332, 3299; IV: 3753, 4143, 4335
at high speed, I: 173, 752; II: 1514, 2131; III: 3552; IV: 3859, 4143, 4190, 4335, 4579, 5001, 5035
cause of injuries, IV: 3999
equipment, IV: 5018
hazards, IV: 4820, 4865
at low altitude, IV: 3865
effects of posture, III: 2330
equipment, IV: 3837, 4669
hazards, II: 1212
statistics, IV: 5098
training devices, IV: 4401
training methods, IV: 3928, 4107
BALLISTOCARDIOGRAM (see also Ballistocardiography)
effects of:
anoxia, II: 1801

anti-g suits, IV: 5049
heat, III: 3542
jet plane piloting, IV: 4642
physical work, III: 2504
pressure breathing, II: 1191

BALLISTOCARDIOGRAPHY, I: 901; II: 1801

BALLOON FLIGHT, III: 2868
animal experiments, IV: 3919

BALLOON LAUNCHING, II: 1628

BANTHINE
use in motion sickness, I: 236

BARBITURATES see Barbituric acid derivatives

BARBITURIC ACID DERIVATIVES
effects on:
anoxia tolerance, II: 1400
circulation, II: 1964
temperature regulation, IV: 5044
use in motion sickness, IV: 4715

BAROMETRIC PRESSURE (see also Altitude)
effects on:
arthritis, I: 521
auditory perception, I: 669
drug action, II: 1205
middle ear, II: 2154
skin, I: 365

BAROTRAUMA see Aerotitis media; Sinus barotrauma

BASAL METABOLISM see Metabolism

BEHAVIOR see also under Teams
analysis, II: 1183
effects of:
anoxia, III: 2506
anxiety, IV: 4661
relation to age, II: 1298
test methods, IV: 3741, 4843

BELGIUM see under Aviation medicine

BELTS see Safety belts

BENADRYL (Diphenhydramine hydrochloride)
effects on:
fatigue, IV: 4757
mental performance, I: 689; II: 1917
nystagmus, IV: 3785
psychomotor performance, II: 1549, 1914, 1915, 1916
use in motion sickness, I: 142, 231, 234, 236, 689, 768; II: 1225

BENDS see Decompression sickness

BENTYL
use in motion sickness, I: 236

BENZEDRINE see Amphetamine

BIBLIOGRAPHY see under Accidents, prevention; Aviation medicine; Aviation medicine, research; Dark adaptation; Emergency rations; Form perception; Job analysis; Leadership; Military medicine; Military psychiatry; Night vision; Noise, general physiological effects; Noise, measurement; Noise, reduction; Psychomotor performance; Spatial orientation; Stress sensitivity; Visual perception

BINAURAL HEARING
effects on:
auditory perception, III: 2482; IV: 3838
speech intelligibility, IV: 3918

BINOCULAR VISION (see also Heterophoria; Ocular convergence; Ocular dominance), II: 979, 1211
effects of image disparity, III: 3117
role in:
depth perception, II: 975, 1068, 1211, 1233, 1315, 1901; III: 2672, 2673, 2811, 2812, 2979, 3268, 3480, 3532, 3538; IV: 3962, 4067, 5047
size perception, II: 1211; IV: 4870
visual acuity, III: 3257

BINOCULARS see Instrumental magnification

BIOASTRONAUTICS see Space medicine

BIOGRAPHICAL INVENTORY, I: 311; IV: 3823

BIOLOGICAL CLOCK see Biological rhythms

BIOLOGICAL EFFECTS see under Cosmic rays; Ionizing radiations; Nuclear radiations

BIOLOGICAL RHYTHMS (see also Activity rhythm; Adrenal activity rhythm; Autonomic nervous activity rhythm; Body temperature rhythm; Excretory rhythm; Galvanic skin response rhythm; Menstruation; Ocular rhythms; Pancreatic rhythm; Pulse rate rhythm; Respiratory rhythm; Sleep), III: 3020
effects of:
activity cycle, IV: 4834
endocrine system, IV: 4852
environmental factors, IV: 3747
illumination, III: 2961
intermedin, III: 2804
time estimation, IV: 4105
relation to:
cosmic ray cycle, IV: 3894
diurnal cycle, III: 2530, 2542, 2961; IV: 3895, 4105, 4990, 5030
lunar cycle, IV: 3895

BIOLOGICAL WASTE PRODUCTS see Feces, Urine

BLACKOUT, II: 1331
electroretinogram, IV: 4532
relation to retinal circulation, II: 1693; III: 2682

BLAST (see also Wind blast)
cause of anxiety, II: 1859
effects on:

autonomic nervous system, II: 2050
blood oxygen tension, II: 1243
brain, I: 226
circulation, II: 1242
ear, II: 1008, 1349, 2109
eye, III: 3386
hearing, I: 393
lung, I: 225, 226; III: 2576, 2597
nervous system, III: 3386
respiration, II: 1242, 1243
general physiological effects, I: 224, 225, 226, 393; II: 1008, 1119; III: 2598
reviews, IV: 4109
general psychological effects, II: 1859
reviews, IV: 4109
research methods, IV: 3978
BLAST INJURIES
first aid, II: 1119
BLINDNESS see Color blindness
BLEEDING see Blood loss
BLOOD (see also Blood cells; Blood plasma)
carbon dioxide tension, I: 222, 223, 899; II: 1044
effects of:
apnea, II: 1418
carbon dioxide, II: 1259; III: 3429
hyperoxia, II: 1695
effects on heart function, IV: 4329
measurement, II: 1066, 1259, 1694
relation to respiration, III: 2872, 2873
carbon monoxide content
measurement, IV: 3960, 5132
catalase content
effects of:
altitude, III: 3197
anoxia, III: 2801
physical work, III: 2801
cholinesterase content
effects of altitude, IV: 4491
effects of:
altitude, I: 355, 452, 625, 828, 899; II: 1169; III: 3370, 3545
altitude acclimatization, I: 827; III: 3401
anoxia, I: 98, 256, 545, 630; II: 994, 1045, 1392, 1421, 1783; III: 2398, 2937; IV: 4903
artificial respiration, II: 1578
blood loss, II: 1252
carbon dioxide, II: 1421; III: 3005, 3430
carbon monoxide, I: 256; II: 2266
cold, I: 448
explosive decompression, I: 529; II: 1653
heat, I: 613; III: 2568, 2750, 2751, 3413; IV: 3834
hypercapnia, II: 990
hyperoxia, I: 664; II: 990, 1739
hypothermia, III: 2626, 2982; IV: 5003
mental stress, II: 1925
noise, I: 449; II: 1127, 1172
oxygen breathing, II: 1578; III: 2752
pressure breathing, II: 1651
respiration, II: 990
vibration, II: 1175, 1176
electrolyte content
effects of hibernation, IV: 4853
gas bubble formation, IV: 3810, 4301
lipase content
effects of altitude, IV: 4542
lipid content
effects of:
anoxia, IV: 4465
flight duty, IV: 4218
relation to age, I: 644, 645; IV: 4218
oxygen tension, I: 155, 222, 316, 403, 450, 452, 544, 545, 821, 823; II: 1044, 1045, 2091
effects of:
blast, II: 1243
carbon dioxide, II: 1259
hyperoxia, II: 1695
hyperventilation, II: 1521
nitrogen breathing, II: 1930
oxygen breathing, IV: 5126
physical work, IV: 5126
pressure breathing, I: 452
voluntary apnea, I: 403, 544, 705; II: 1418, 1943; IV: 4137
effects on:
altitude tolerance, IV: 4704
carotid sinus reflexes, IV: 5180
coronary circulation, III: 2361; IV: 3713
measurement, II: 1066, 1240, 1244, 1259, 1694; III: 3672
relation to:
alveolar oxygen tension, II: 2269; III: 2353
sleep, III: 3598
pH
effects of:
anoxia, IV: 5050
hyperventilation, III: 3137
hypothermia, III: 3273; IV: 4002
relation to:
altitude tolerance, IV: 4780
phosphate content
effects of altitude, IV: 4610
plasmalogen content

effects of vestibular stimulation, IV: 4644
potassium content
effects of altitude, IV: 4817
effects on heart function, IV: 3893
pressure see Blood pressure
sugar content see Blood sugar
temperature
effects of explosive decompression, II: 2210
volume see Blood volume

BLOOD BANKS, II: 1734

BLOOD CELLS (see also Hematopoiesis; Hemoglobins; Polycythemia; sicklemia; Thrombocytes)
effects of:
airplane flight, II: 1461; III: 2678, 2890, 3233
altitude, I: 348, 419, 448, 733, 791, 865; II: 1741, 2006, 2215, 3022; IV: 4781, 4801
altitude acclimatization, I: 356, 557, 826; II: 2207; III: 2473, 2696, 3342, 3364, 3569; IV: 4781
anoxia, I: 306; II: 988, 1479, 1481, 1699, 2207; III: 2368; IV: 5050
carbon monoxide, III: 2757
cold, II: 1691
cold acclimatization, III: 2657, 3519
combat stress, II: 1318, 1319
conditioned reflexes, II: 1741, 1933
diurnal cycle, II: 1461
fatigue, II: 1461
flight duty, IV: 4072
heat, III: 2748, 3093; IV: 4302
hesperidin, IV: 5103
hypercapnia, III: 3003, 3428
hypothermia, IV: 4334
mental stress, II: 1320
noise, II: 1171, 1172; IV: 3738, 3739
physical work, I: 348; II: 2220; III: 2748
starvation, III: 3030
stress, II: 1318, 1319, 1320, 1462, 1691
ultrasonic vibrations, I: 417; II: 1171, 1172, 1498; III: 2829

BLOOD CHOLESTEROL see Blood, lipid content

BLOOD CLOTTING see Blood coagulation

BLOOD COAGULATION
effects of:
altitude, IV: 3950
anoxia, IV: 4465

BLOOD DONATION see Blood banks; Blood loss

BLOOD FLOW see Circulation

BLOOD LOSS
effects on:
anoxia tolerance, II: 1252
blood, II: 1252
circulation, II: 1056
hematopoiesis, II: 1904, 1905
respiration, II: 1056
work capacity, II: 1032; III: 2874

BLOOD PLASMA (incl. serum)
effects of:
adenosine monophosphate, II: 1820
altitude, I: 539, 554, 731, 761, 854; II: 1392
anoxia, IV: 4601
carbon dioxide, IV: 3892
cold, II: 1992, 1993; III: 3547
cosmic rays, I: 204
heat, III: 2989
heparin, II: 1820, 1992
iron content, IV: 3868

BLOOD PLASMA VOLUME
effects of altitude, III: 2705

BLOOD PLATELETS see Thrombocytes

BLOOD PRESSURE (see also Cold pressure test)
effects of:
abdominal pressure, II: 1106; III: 3085
airplane flight, I: 844
altitude, II: 1169; IV: 4464
altitude acclimatization, III: 3131
anoxia, I: 196; II: 1476; III: 2825, 3238; IV: 4889
carotid occlusion, I: 719
cold, IV: 3888
drugs, I: 196, 608, 719; IV: 3888
anesthetics, I: 196
epinephrine, III: 2825
explosive decompression, II: 2023; IV: 3774
Flack test, III: 3326
flight duty, III: 3399
heat, IV: 3888
hypothermia, III: 2881
intrapulmonary pressure, II: 1106
oxygen breathing, IV: 4889
physical work, IV: 4464, 4481
positive acceleration, IV: 4506
postural change, III: 3131
posture, IV: 4481
pressure breathing, I: 131, 397, 399, 406, 452; II: 1657, 1968; III: 2827, 2835, 2951; IV: 4249
respiration, III: 3443
rotation, II: 1348
Valsalva maneuver, II: 1106, 1965
measurement, IV: 5204
relation to:
adrenal glands, III: 2770

physical fitness, III: 2648
pulmonary circulation, II: 2048
BLOOD SUGAR
effects of:
altitude, III: 3218
altitude acclimatization, II: 1263
anoxia, III: 3691
cold acclimatization, III: 3169, 3519
hyperventilation, II: 2282
piloting, I: 589
stress, III: 2787; IV: 4572
vestibular stimulation, IV: 4900
relation to perspiration, III: 2892
role in:
anoxia tolerance, III: 3051
cold tolerance, III: 3051
BLOOD SUPPLY see Circulation
BLOOD TRANSFUSION
equipment, IV: 3829
BLOOD VESSELS (see also Carotid; Hemorrhoids; Retinal blood vessels. See also entries under Vasoconstrictor effects)
effects of:
altitude acclimatization, III: 3294, IV: 3803
anoxia, II: 1689
mechanical properties, I: 305
BLOOD VOLUME (see also Blood plasma volume)
effects of:
altitude, III: 2705, 2706, 3544
heat, III: 3093
hypothermia, III: 2637
measurement, III: 3441
BODY CAVITIES see Gas in body cavities
BODY FAT
effects of:
altitude acclimatization, III: 3478
heat, I: 670
physical work, I: 670
effects on skin temperature, IV: 3769
role in temperature regulation, IV: 3769
BODY FLUIDS (see also Blood; Cerebrospinal fluid; Tissue fluids; Water exchange)
distribution
effects of:
acceleration, I: 368; II: 1441; III: 2786
pressure breathing, IV: 4116
restraint, III: 2786
effects of anoxia, II: 994; III: 2398
BODY GASES (see also Flatus)
effects of explosive decompression, II: 2218
BODY MEASUREMENTS (see also Foot measurements; Head measurements; Somatotype), I: 228; II: 1278, 1279, 1280; III: 2925; IV: 4039
of inhabitants of mountains, I: 861, 862; IV: 4880
relation to:
age, I: 656
human engineering, III: 3144; IV: 4670
statistics, II: 2280; III: 3072; IV: 4082
BODY MOTION PERCEPTION see Motion perception (Passive)
BODY SIZE see Body measurements
BODY SURFACE
relation to heat loss, II: 1504
BODY TEMPERATURE (see also Hyperthermia; Hypothermia; Temperature regulation)
effects of:
anoxia, I: 194, 195; IV: 3949, 4794, 4795, 4796
chlorpromazine, IV: 3945
climate, III: 2337
cold, I: 194, 195; III: 2448; IV: 3912, 3945, 4261
cold acclimatization, IV: 3778
cold air breathing, IV: 4517
heat, III: 2892, 3675; IV: 3856
humidity, IV: 3912
physical work, II: 1812; III: 2617, 2892, 3674
pyrogenic agents, IV: 3949
restraint, III: 2448; IV: 3788
relation to:
anoxia tolerance, II: 1400; III: 3230
metabolism, IV: 4219
oxygen consumption, IV: 4794, 4795
temperature regulation, IV: 4219
BODY TEMPERATURE RHYTHM
effects of altitude, IV: 5172
relation to activity rhythm, III: 3013
BODY TYPE see Somatotype
BODY WEIGHT
effects of:
anoxia, III: 3397
carbon dioxide, III: 3429
cocaine, III: 3106
cold, IV: 4049
flight duty, II: 1875
somatropin, III: 3397
relation to decompression sickness, I: 270
BOMBARDIERS
occupational diseases, II: 2277
BONAMINE see Meclizine and derivatives
BONE (see also Pelvis; Skull)
effects of:
anoxia, II: 1421
carbon dioxide, II: 1421
ultrasonic vibrations, II: 1865

vibration, II: 2089, 2090

BONE CONDUCTION

measurement, IV: 4625

relation to:

age, II: 2171

auditory perception, I: 918; II: 1317, 1420, 1454, 1542, 2303; III: 2496

BONE INJURIES (see also Spine injuries), II: 2047

BONE MARROW (see also Hematopoiesis)

effects of:

altitude, III: 2986

anoxia, II: 1984, 1985; IV: 4903

metabolism

effects of anoxia, II: 1984, 1985

BOOTS, I: 655; II: 978

BRAIN (see also Brain activity; Cerebral circulation; Cerebral cortex; Cerebrospinal fluid; Hypophysis; Intracranial pressure; Respiratory center; Vomiting center)

action potential see Electroencephalogram

effects of:

anoxia, I: 584; II: 2066; III: 2459, 3099; IV: 5068

post-mortem findings, III: 3091

blast, I: 226

carbon monoxide, III: 2459

cosmic rays, III: 3475

explosive decompression, I: 418

impact, IV: 4287

negative acceleration, IV: 3809

noise, III: 2553

sound, IV: 4734

ultrasonic vibrations, II: 1566, 1865; III: 2829

metabolism (see also Brain, sodium-potassium ratio)

effects of:

altitude acclimatization, II: 966, 968, 1321

anoxia, II: 967, 969, 971, 1321, 1909, 1910, 2085, 2111; III: 2956, 3549; IV: 5056

hyperoxia, II: 1695

hypothermia, III: 3393; IV: 4469

ischemia, III: 3549

mental work, IV: 4989

mescaline, IV: 4093

physical work, III: 3432

positive acceleration, IV: 3910

role in altitude acclimatization, II: 1931

sodium-potassium ratio

effects of:

acceleration, III: 2786; IV: 4404

restraint, III: 2786; IV: 4204

BRAIN ACTIVITY

effects of:

altitude, I: 681; II: 1677; III: 3021, 3523

altitude acclimatization, I: 681; III: 3021

anoxia (see also Time reserve), I: 388, 401, 587, 609; II: 981, 1065, 1147, 1328, 1677, 1836, 2283; IV: 5183

carbon dioxide, IV: 5183

heat, III: 3502

hyperoxia, III: 2455; IV: 5183

ischemia, II: 1328

vestibular stimulation, II: 1669

relation to nystagmus, II: 1819

role in respiration, II: 1799

BRAIN WAVES see Electroencephalogram

BRAZIL see under Aviation medicine

BREATHING see Cold air breathing; Nitrogen breathing; Oxygen breathing; Pressure breathing; Respiration

BRIGHTNESS ADAPTATION see Retinal adaptation

BRIGHTNESS DISCRIMINATION, I: 346, 658; III: 2858

effects of:

anoxia, I: 245

fatigue, IV: 3767

illumination, IV: 3835, 4330, 4522

light stimuli, II: 1051, 1300

noise, I: 193

retinal image position, IV: 4358

X-rays, II: 1431

general physiological factors, II: 1713

relation to:

color vision, II: 1121

contour perception, II: 1753

depth perception, III: 3232; IV: 4000

form perception, II: 1864

radar operation, IV: 4212

retinal adaptation, III: 3227; IV: 3877

test methods, II: 1039

tests, II: 1310

thresholds, II: 1124

time factors, III: 2922; IV: 3835

BUBBLE FORMATION see entries under Gas bubble formation

BURNS

treatment, I: 238; III: 3618

BUSCOPAN

use in motion sickness, I: 236

CABINS (see also Cockpits; Helicopter cabins; Pressure cabins; Sealed cabins; Space cabins)
air conditioning, I: 697; II: 1692, 1740
cooling, IV: 4132
deodorization, I: 366, 367; II: 1692; IV: 4365
human engineering, I: 174, 285, 395, 593, 697, 779; II: 1635, 1755, 1997
humidity, III: 3045
temperature, II: 1491, 1492, 1635; III: 3045
effects of high speed flight, III: 2960
temperature control, II: 1635, 1692
ventilation, II: 1692
CADETS see Trainees
CAFFEINE
effects on:
color vision, II: 2064
electroencephalogram, IV: 4716
fatigue, IV: 4323
psychomotor performance, II: 1549
CALORIC STIMULI (see also Thermal radiation)
effects on labyrinth, III: 3059
CANADA see under Air evacuation; Aviation medicine; Rescue medical teams
CANDIDATES see Pilot candidates
CAPACITY see Vital capacity
CAPSULES see Escape capsules
CARBOHYDRATE METABOLISM
effects of:
altitude, I: 362
anoxia, II: 1261, 1262, 1266, 1267, 1909; IV: 3996, 4489
carbon dioxide, III: 3429; IV: 4914
cold, III: 3642
cold acclimatization, III: 3280; IV: 4747
diet, IV: 4139
hypercapnia, II: 1266; III: 3428
hyperoxia, III: 3301
relation to:
anoxia tolerance, III: 3191
diurnal cycle, III: 3020
electroencephalogram, IV: 5189
CARBON DIOXIDE (see also Alveolar carbon dioxide tension; Hypercapnia. See also Carbon dioxide tension under Blood)
effects on:
adrenal glands, III: 3429; IV: 4462, 4914
altitude tolerance, II: 1522
alveolar carbon dioxide tension, II: 2143
blood, II: 1421; III: 3005, 3430
blood carbon dioxide tenion, II: 1259; III: 3429
blood oxygen tension, II: 1259
blood plasma, IV: 3892
body weight, III: 3429
bone, II: 1421
brain activity, IV: 5183
carbohydrate metabolism, III: 3429; IV: 4914
cerebral circulation, II: 2061
chemoreceptors, II: 1368; III: 2587
circulation, II: 1570; III: 2902
drug action, IV: 4457
electrical potentials of cochlea, I: 896; II: 2275
electrocardiogram, I: 864
electroencephalogram, I: 758; II: 2058; III: 3431
electromyogram, I: 758
endogenous formation of carbon monoxide, II: 1784
flicker fusion frequency, II: 2058; III: 3431
heart function, IV: 3893
heart metabolism, II: 1266
liver metabolism, IV: 4457
metabolism, III: 2447
muscular system, I: 758
nitrogen elimination, II: 1522
oxygen consumption, IV: 4947
potassium metabolism, II: 1266; IV: 3892
psychomotor performance, I: 881; II: 2243
pulmonary circulation, II: 2145
pulse rate, III: 3430
respiration, I: 101, 672, 757, 822, 881; II: 1208, 1259, 1368, 1433, 1522, 1523, 1697, 2143, 2243; III: 2436, 2617, 3084, 3129, 3430, 3633; IV: 3997, 4947, 4949, 5026
visual perception, II: 1393
elimination see Carbon dioxide elimination
general physiological effects, II: 1421; III: 3005, 3635
in respiratory gases
measurement, II: 1323; III: 2551; IV: 4621, 5164
production see Carbon dioxide production
tolerance see Carbon dioxide tolerance
CARBON DIOXIDE DEFICIENCY see Hypocapnia
CARBON DIOXIDE ELIMINATION
effects of Diamox, II: 1060; III: 2573
CARBON DIOXIDE PRODUCTION (see also Carbonic anhydrase), I: 187
effects of anoxia, I: 187
CARBON DIOXIDE TENSION see under Blood; Tissues. Also see Alveolar carbon dioxide tension
CARBON DIOXIDE TOLERANCE, I: 881; II: 2243; III: 3633; IV: 3875, 4296, 4297

CARBON MONOXIDE (see also Carbon monoxide content under Blood)
acclimatization see Carbon monoxide acclimatization
detection, II: 1510; IV: 3994
effects on:
blood, I: 256; II: 2266
blood cells, III: 2757
brain, III: 2459
chemoreceptors, I: 316
pulmonary circulation, II: 1339
X-ray tolerance, IV: 4476
endogenous formation, III: 2745; IV: 5061
effects of:
anoxia, II: 1784; III: 2481
carbon dioxide, II: 1784
hyperoxia, II: 1784
general physiological effects, II: 2267
reviews, IV: 5061
hazards (see also Carbon monoxide poisoning), II: 1786; IV: 4119, 4206, 4861
tolerance see Carbon monoxide tolerance
CARBON MONOXIDE ACCLIMATIZATION
effects on:
carbon monoxide tolerance, III: 3657
circulation, III: 3088
hemoglobin composition, III: 3581
CARBON MONOXIDE POISONING (see also Carbon monoxide, hazards), II: 1811
effects of oxygen breathing, III: 2757
reviews, IV: 5061
role of tobacco, III: 2740
treatment, II: 942
CARBON MONOXIDE TOLERANCE, III: 3046
effects of:
altitude acclimatization, III: 3657
carbon monoxide acclimatization, III: 3657
CARBON TETRACHLORIDE
effects on fertility, I: 11
toxic effects, I: 11, 27, 263; III: 2885
CARBOXYPEPTIDASE, I: 338
CARCHOLIN
effects on dark adaptation, II: 1385
CARDIAC ... see Heart
CARDIAC FREQUENCY see Pulse rate
CARDIAZOL see Metrazol
CARDIOVASCULAR DISEASES (see also Arteriosclerosis; Heart, pathology)
effects on air transportability, I: 303, 387, 704, 785; II: 1600, 1790, 1791, 1792; III: 2315, 3464, 3508; IV: 3872, 4035, 4298, 4888
relation to lipid metabolism, II: 1820; III: 3203
CARDIOVASCULAR SYSTEM (see also Blood; Blood vessels; Circulation; Heart; Reticulo-endothelial system; Spleen)
effects of:
airplane flight, II: 1306; III: 2306, 3521; IV: 4257
high speed flight, III: 3521
intrapulmonary pressure, III: 2999
jet plane piloting, III: 3398
postural change, III: 3606
examination, I: 684; II: 1743; IV: 4257, 4553, 5025, 5171
function tests, IV: 4907
relation to adrenal glands, III: 2938
CAROTID OCCLUSION
effects on blood pressure, I: 719
CAROTID SINUS REFLEXES
effects of:
anoxia, II: 1345
blood oxygen tension, IV: 5180
CASUALTIES see Aviation casualties; Patients
CATALASE see Blood, catalase content
CATAPULTS (see also Ejection seats; Escape capsules), I: 474; IV: 4337
CELLS see Blood cells; Emergency pressure cells
CENTRAL NERVOUS SYSTEM (see also Brain; Spinal cord)
effects of:
altitude, IV: 4325
anoxia, III: 2509
ultrasonic vibrations, III: 2761
role in anoxia tolerance, II: 2086
CENTRIFUGES see Human centrifuges
CENTROPNEIN
effects on anoxia tolerance, I: 821, 823; III: 3349
CEREBRAL CIRCULATION
effects of:
acceleration, I: 875
acidosis, II: 2060
alkalosis, II: 2060
altitude, I: 223
anoxia, IV: 4645
carbon dioxide, II: 2061
fatigue, IV: 4606
hypercapnia, III: 3292
hyperoxia, II: 1695; IV: 4645
hypothermia, III: 3393; IV: 4469
mental work, IV: 4989

mescaline, IV: 4093
negative acceleration, I: 307, 308, 309
physical work, III: 3432
positive acceleration, III: 2461
sleep deprivation, IV: 4606
measurement, I: 222, 875
relation to:
age, II: 2061
retinal circulation, II: 1570
sleep, IV: 4606

CEREBRAL CORTEX (see also Auditory cortex)
sensory areas, III: 3198
vestibular area, III: 3200

CEREBROSPINAL FLUID
pH
effects of anoxia, III: 2809

CEREBROSPINAL FLUID PRESSURE (see also Intracranial pressure)
effects of postural change, III: 2725, 2726

CERTIFICATION see under Flight surgeons; Pilots

CHAIRS see Revolving chairs; Seats

CHAPPING see under Skin

CHARTS
legibility, III: 3454; IV: 4263
test methods, II: 1861

CHEMORECEPTORS
effects of:
anoxia, III: 2406
carbon dioxide, II: 1368; III: 2587
carbon monoxide, I: 316
physiology, II: 1739; III: 2413
role in:
anoxia tolerance, II: 1221
hematopoiesis, IV: 5050

CHLORELLA see Algae

CHLORIDE METABOLISM (see also Sodium chloride)
effects of:
heat, III: 2911, 3622
humidity, III: 2911

CHLOROPHYLL
effects on anoxia tolerance, II: 1400

CHLOROQUINE see Quinine and derivatives

CHLORPROMAZINE
effects on:
anoxia tolerance, II: 1221; III: 3349; IV: 4029
body temperature, IV: 3945
galvanic skin response, IV: 3979
hyperoxia tolerance, III: 2832, 2845, IV: 4282
metabolism, IV: 5044
oxygen consumption, IV: 3945
perspiration, IV: 3979
skin temperature, IV: 3979
temperature regulation, IV: 4029, 5044
use in motion sickness, III: 2610

CHOLESTEROL see Blood, lipid content; Lipid metabolism

CHOLINESTERASE see Cholinesterase content under Blood

CHROMATOGRAPHIC ANALYSIS see under Steroids

CHRONAXIA, II: 1781, 1818

CINERADIOGRAPHY see Roentgenography

CIRCULATION (see also Blood; Cerebral circulation; Coronary circulation; Cutaneous circulation; Ischemia; Lymph flow; Pulmonary circulation; Renal circulation; Retinal circulation)
effects of:
abdominal pressure, II: 1064, 1105, 1512
acceleration, II: 1803; IV: 4095
airplane flight, II: 1743; IV: 4553
altitude, I: 290, 381, 527, 621; II: 1456, 1518, 1546, 1790, 1791, 1792, 2151; III: 2634, 2896; IV: 3942, 4509
altitude acclimatization, II: 1055, 1057, 1838; III: 3294; IV: 4662
anoxia, I: 128, 194, 195, 386, 569, 803; II: 1055, 1056, 1057, 1147, 1601, 2129; III: 2822, 2962, 3083, 3237, 3435, 3444; IV: 4692, 4693, 5111, 5116
anxiety, II: 1691
apnea, IV: 4173
artificial respiration, III: 3158
blast, II: 1242
blood loss, II: 1056
carbon dioxide, II: 1570; III: 2902
carbon monoxide acclimatization, III: 3088
cold, II: 1728; IV: 4273, 4343, 5167
race factors, IV: 4636
cold acclimatization, III: 2545; IV: 3931
conditioned reflexes, III: 3290
drugs, I: 196, 719
antihistaminics, IV: 5167
Aramine, IV: 4898
barbituric acid derivatives, II: 1964
quinine, II: 1245
succinates, II: 1281

vasopressin, I: 608

environmental temperature, III: 2366; IV: 3815

explosive decompression, I: 529; II: 1428, 1477, 1574, 1653, 2248

heat, IV: 3898

hyperoxia, II: 1456, 2250; III: 3530

hypocapnia, III: 2557

hypothermia, III: 2983; IV: 4304, 4891, 5113

mental stress, II: 1776

mental work, III: 3290

negative acceleration, II: 1422

noise, II: 1268

oxygen breathing, II: 1570; IV: 4631

peripheral pressure, II: 1064; III: 2841; IV: 4821

physical work, I: 115, 878; II: 1838; IV: 4555

postural change, IV: 3898

posture, I: 392, 591; III: 3479; IV: 4128

pressure breathing, I: 131, 397, 399, 406; II: 1140, 1141, 1142, 1651, 1964; III: 2826, 3186; IV: 4116, 4379, 4898, 4945, 5111

respiration, II: 1139, 1140, 1141, 1840

rotation, II: 1347; III: 2699, 3624

solar radiation, II: 1546

starvation, III: 3030

stress, III: 3029; IV: 4463

subgravity, I: 475; II: 931, 1742; III: 2319

tilting, III: 2716, 2784

tumbling, IV: 4095

ultrasonic vibrations, II: 1884; III: 2829

vibration, I: 450; II: 1505, 1506

voluntary apnea, I: 705; II: 1943

weather, I: 290; II: 1776

effects on skin temperature, IV: 3822

psychological factors, IV: 4463

relation to:

age, III: 2559, 3324

muscular tonus, IV: 4494

positive acceleration tolerance, IV: 4587

respiration, III: 3023

role of autonomic nervous system, II: 1546

CITRATE METABOLISM

effects of altitude acclimatization, IV: 3830

CIRCULATORY SYSTEM see Cardiovascular system

CLASSIFICATION see under the various personnel categories, e.g., Personnel, classification

CLAUSTROPHOBIA

relation to personality, IV: 4467

CLEANING SOLUTIONS see Organic solvents

CLIMATE (see also Cold climates; Hot climates; Weather)

effects on:

body temperature, III: 2337

psychomotor performance, II: 1918, 1919, 1920

vigilance, II: 1922

general physiological effects, II: 1921

test methods, II: 957; III: 2313, 2634

relation to accidents, III: 2339

CLOSED ECOLOGICAL SYSTEMS, IV: 4327

CLOTHING (see also Altitude suits; Anti-g suits; Boots; Exposure suits; Fire protective clothing; Gloves; Helmets; Masks)

effects on:

cold tolerance, II: 1524; III: 2875

neuromuscular performance, IV: 4901

psychomotor performance, IV: 4901

temperature regulation, IV: 4079

evaluation, I: 505

thermal properties, IV: 4304

CLOTTING see Blood coagulation

COAGULATION see Blood coagulation

COBALT COMPOUNDS

effects on anoxia tolerance, IV: 5154

COCAINE

effects on body weight, III: 3106

COCHLEA

action potentials see Cochlea, electrical potentials

effects of:

anoxia, I: 558

jet engine noise, II: 973

noise, I: 271, 427, 428, 838, 839; II: 973; III: 2623, 3482

sound, II: 1284, 1287; IV: 3714

ultrasonic vibrations, IV: 3737

electrical potentials, I: 134

effects of:

anoxia, I: 896; II: 1118, 2275; III: 2805; IV: 4025, 5070

carbon dioxide, I: 896; II: 2275

diisopropyl fluorophosphate, I: 839

noise, I: 838

sodium azide, I: 839

sound, I: 839; II: 1284, 1287; IV: 5070, 5157

relation to hearing, I: 917; II: 1118, 1284; IV: 3715

microphonics see Cochlea, electrical potentials

pathology, II: 973; IV: 5157

physiology, I: 918; IV: 3814

role in pitch discrimination, IV: 3715

COCKPITS (see also Windshields)

air conditioning, III: 3076

human engineering, I: 33, 45, 285, 341, 538, 764, 802; II: 1638, 1806; III: 2310, 2325, 2327, 2656, 3068, 3298, 3387, 3485; IV: 4039, 4074, 4275, 4373, 4670, 4977, 4978, 5010

illumination, II: 2069; III: 3141

CODEINE

effects on labyrinth, II: 2859

COENZYMES see under Enzymes

COLD

acclimatization see Cold acclimatization

cause of life suspension, III: 2462

effects on:

adrenal glands, II: 1842; III: 2645, 2646, 2995, 3193; IV: 4085

altitude tolerance, I: 421, 422; III: 2756

anoxia tolerance, II: 1972

blood, I: 448

blood cells, II: 1691

blood plasma, II: 1992, 1993; III: 3547

blood pressure, IV: 3888

body temperature, I: 194, 195; III: 2448; IV: 3788, 3912, 3945, 4261

body weight, IV: 4049

circulation, II: 1728; IV: 4273, 4343, 4636, 5167

electrocardiogram, IV: 4486

flicker fusion frequency, III: 3537; IV: 5048

food intake, IV: 4203

hypophysis, III: 2995; IV: 5007

insects, II: 1907; IV: 4745

kidney, II: 1842

kidney function, IV: 4724

metabolism, I: 469; III: 2619, 2659, 2889, 3278, 3461, 3499; IV: 4027, 4613, 4635

oxygen consumption, III: 2513, 2658; IV: 3788

metabolism of organs

adrenal glands, IV: 4710

kidney, II: 1842

liver, III: 2658, 3452, 3642; IV: 4617, 5145

skin, IV: 4050

tissues, IV: 4410

metabolism of substances

ascorbic acid, II: 1842; III: 2689, 2995 IV: 4049

carbohydrates, III: 3642

ketones, III: 3417

lipids, III: 2888; IV: 3813, 5080, 5081

phosphorus, IV: 4710

proteins, III: 2888

steroids, IV: 4106

succinic acid, IV: 4050

muscular system, IV: 4536

neuromuscular performance, I: 119, 595; II: 1765; III: 3136

pain sensitivity, III: 3537; IV: 5048

psychomotor performance, III: 3537; IV: 5048

skin temperature, IV: 3769

stress sensitivity, III: 3001

survival, IV: 4471

tactile perception, I: 119; II: 1765; III: 3142; IV: 4592

temperature regulation, IV: 4027

thyroid gland, III: 2645, 2646; IV: 4038, 4049, 4197, 4443, 5007

urine composition, III: 2959; IV: 4443

work capacity, III: 3220

general physiological effects, III: 2640, 3024, 3267, 3379; IV: 3914, 4449

handbooks and treatises, IV: 3913

race factors, IV: 3897

pathological effects (see also Frostbite), III: 3566

reviews, IV: 4535

protection, II: 978

tolerance see Cold tolerance

COLD ACCLIMATIZATION, IV: 4636

effects of ascorbic acid, IV: 4048

effects on:

adrenal glands, IV: 4019

altitude tolerance, III: 2755

blood cells, III: 2657, 3519

blood sugar, III: 3169, 3519

body temperature, IV: 3778

carbohydrate metabolism, III: 3280; IV: 4747

circulation, III: 2545; IV: 3931

cold tolerance, III: 2747; IV: 4346

lipid metabolism, III: 3280, 3452

metabolism, III: 2619; IV: 3778, 3976, 4040, 4482

steroid excretion, IV: 4019

tactile perception, IV: 4592

temperature regulation, III: 2439, 2440, 2920 IV: 3779, 3930, 4482

tissue metabolism, II: 1241; III: 2593

role of:

adrenal glands, III: 2657, 2917, 2918, 2919, 3169; IV: 4048

thyroid gland, IV: 4048

COLD AIR BREATHING

effects on:

body temperature, IV: 4517

respiration, IV: 4517

COLD CLIMATES

general physiological effects, II: 1691; III: 3216

nutritional requirements, III: 2393, 2477, 2914, 2991, 3210, 3211, 3279, 3417, 3655; IV: 4856, 4868, 4896, 4897, 5080, 5081

research methods, III: 3358

COLD PRESSURE TEST, III: 2648, 3025

COLD TOLERANCE, I: 825

effects of:

altitude acclimatization, III: 2756

anesthesia, III: 2448

clothing, II: 1524; III: 2875

cold acclimatization, III: 2747; IV: 4346

drugs

ascorbic acid, III: 2512, 2688, 2689, 2747, 2991, 3070, 3642; IV: 3862

cortisone, IV: 3862

hydergine, I: 509

rutin, IV: 3727

somatropin, IV: 4084

vitamin B complex, III: 3351

hypocapnia, III: 3051

nutrition, III: 3277

restraint, III: 2448

of insects, IV: 4743

relation to age, IV: 4164

role of:

adrenal glands, III: 2512; IV: 3862, 4346

blood sugar, III: 3051

enzyme activity, III: 2512

COLOR ADAPTATION, III: 2996

effects of light stimuli, II: 1683

COLOR BLINDNESS

use of color signals, IV: 4968

COLOR SIGNALS

effectiveness, IV: 4686

use in color blindness, IV: 4968

COLOR VISION, I: 228; IV: 4390

effects of:

anoxia, I: 175; II: 2064; III: 2963

drugs, II: 2297

alcohol, II: 2064; IV: 4859

caffeine, II: 2064

neostigmine, II: 1682

physostigmine, II: 1682

illumination, II: 1146, 1605, 1817, 1974, 2062; III: 3356; IV: 4770

oxygen breathing, I: 175

sound, II: 1949

relation to:

brightness discrimination, II: 1121

dark adaptation, I: 499; II: 1122, 1855; III: 2412 IV: 4770

foveal vision, II: 1177, 1607, 1620, 1939

night vision, IV: 4639

peripheral vision, II: 1939

retinal adaptation, I: 200; II: 991, 1146, 1184, 1604, 1607, 1620; IV: 3757, 3877, 4639

visual acuity, II: 1893

role of acetylcholine metabolism, II: 1948, 1949

test methods, I: 762, 763; II: 1556, 1973, 1975, 1988, 2032, 2062, 2063; III: 2724, 2884, 3438; IV: 3817, 3870

tests, I: 175, 457; II: 1164, 1185; III: 2479, 2585, 2877

thresholds, II: 1122, 1177, 1781, 1939, 1988

time factors, II: 2032

use of:

optical filters, IV: 4838

visual illusions, IV: 4741

COLORS (see also Color under Instrument panels; Life rafts)

effects on:

depth perception, II: 1209

size perception, II: 1086

visibility, I: 144; II: 1785, 2128, 2257; III: 3068

COMBAT CREWS

training, IV: 3845

COMBAT STRESS

cause of neuroses, II: 1729, 2268; III: 3571

effects on blood cells, II: 1318, 1319

general physiological effects, III: 3535

general psychological effects, I: 82; III: 3498, 3535

COMFORT (see also Acoustical comfort; Passenger comfort)

effects of environmental temperature, III: 2313

COMMUNICABLE DISEASES (see also Diphtheria; Poliomyelitis; Scarlet fever; Tuberculosis; Whooping cough)

control (see also Immunization), I: 57, 431; III: 2428

effects on air transportability, I: 319; II: 2008

quarantine, I: 319

COMMUNICATION (see also Speaking; Speech communication; Telegraph operation; see also entries under Cues and Signals)

use of tactile perception, IV: 4201

COMMUNICATION SYSTEMS (see also Intercom systems; Microphones)

effects on speech intelligibility, IV: 4130

human engineering, II: 1408, 1567; IV: 3749, 4338

COMPENSATORY TRACKING, I: 548, 549; II: 1288, 1289, 1290, 1401, 1403, 1475, 1724, 1957; III: 2491, 2899, 2968, 3082, 3295, 3456, 3533, 3623; IV: 4271

tests, IV: 3843, 4919

transfer of training, IV: 3735, 4269, 4866

COMPLEXION (SKIN), III: 3136

COMPLEXITY see Task complexity

CONDITIONED REFLEXES, II: 1665, 1782, 1799; IV: 5142

effects of:

altitude, III: 3355

anoxia, I: 609, 612; II: 1835, 1836, 1933; III: 2388, 3355

heat, III: 3502

rotation, II: 1670, 1898

effects on:

blood cells, II: 1741, 1933

circulation, III: 3290

hematopoiesis, II: 2215

respiration, III: 3290, 3597

relation to vigilance, I: 188

use in hearing tests, II: 1664; III: 2862

CONDUCTION see Bone conduction

CONFIGURATION see Shape configuration

CONFINEMENT see Restraint

CONGESTION see under Nasal passages

CONGRESSES, MEETINGS, AND SYMPOSIA see under Airplane flight, safety; Aviation medicine; Fatigue; Space medicine

CONSTITUTIONAL TYPE see Somatotype

CONTACT LENSES, I: 314; III: 2662

effects on:

depth perception, I: 85, 87, 219

visual perception, I: 314

evaluation, I: 597

CONTAINERS see Animal containers; Food containers; Oxygen containers

CONTOUR PERCEPTION, II: 1752

effects of illumination, II: 1218

relation to brightness discrimination, II: 1753

CONTRAINDICATION see under Drugs

CONTRAST DISCRIMINATION see Brightness discrimination

CONTROL KNOBS

human engineering, I: 154; II: 1283, 1488, 1622, 1623, 1676, 1863, 2235; III: 2522; IV: 3880, 3968, 4094, 4264, 4265, 4266, 4270, 5040

CONTROL LEVERS

human engineering, II: 1622, 1623, 1733, 1885, 1887, 2156; III: 2336, 2572, 3522, 3623; IV: 3763, 3764, 4152, 4267, 4272, 4563, 4866

relation to visual displays, III: 2523; IV: 4267

CONTROL SYSTEMS see Display-control systems; Instrument control systems; Traffic control systems

CONTROL TOWER OPERATORS see Traffic control operators

CONTROLS (see also Aircraft controls; Control knobs; Control levers; Display-control systems; Gunnery controls; Jet engine controls; Switches; Traffic control systems)

human engineering, I: 780; II: 1747, 1849, 1995; III: 2491, 3118; IV: 3734, 3735, 3843, 3879, 4268, 4894, 5134, 5146

CONVERGENCE see Ocular convergence

COOLING see under Cabins

COORDINATION see Neuromuscular performance; Psychomotor performance

CORAMINE see Nikethamide

CORONARY CIRCULATION

effects of:

blood oxygen tension, III: 2361; IV: 3713

hypothermia, III: 2474

CORTEX see Cerebral cortex

CORTICOSTEROIDS see Steroids

CORTICOSTIMULINE see Adrenocorticotropic hormone

CORTISONE

effects on:

anoxia tolerance, III: 3528; IV: 3743

cold tolerance, IV: 3862

COSMIC RAY CYCLE

relation to biological rhythms, IV: 3894

COSMIC RAYS

biological effects, I: 330, 331, 363, 662, 754, 755, 756, 858; II: 2055, 2056, 2088; III: 2490, 2564, 3424, 3425; IV: 3919, 4122, 4125

reviews, IV: 4126

test methods, II: 1367; III: 2717, 3032, 3475, 3681; IV: 4123

effects on:

blood plasma, I: 204

brain, III: 3475

enzyme activity, IV: 4123

skin, III: 2581; IV: 3944, 4124

hazards, I: 753, 835, 836; II: 1638, 2054, 2088, 2104, 2172; III: 2443, 3426; IV: 4123, 4126, 4909, 4910, 4911, 4912, 4913, 4926, 5169, 5176

protection, II: 2056; III: 3427

research methods, IV: 4126

tolerance, III: 3425

COUGH see Whooping cough

CRASH see Impact

CRASH INJURIES (see also items listed under Injuries)

analysis, I: 273, 654; II: 1215, 1296, 1354, 1544, 1633, 2047; III: 2685, 2894, 3322; IV: 3742, 4083, 4141, 4172, 4194, 4320, 4321, 4674, 4755

first aid, II: 1748

prevention (see also Accidents, prevention. See also items under Safety), I: 56, 114, 274, 286, 287, 288, 426, 602; II: 935, 1295, 1297, 1388, 1633, 1798, 2052, 2132; III: 2685, 2848, 3322; IV: 3922, 4321, 4674

research, II: 2276

treatment, I: 694

CRASH WARDS see Airports, hospital facilities

CREATIVITY see Originality

CREWS see Air crews; Space crews

CROUCHING see Anti-g procedures

CUES see Auditory cues; Visual cues

CUPULOMETRY see Labyrinth, effects of rotation, test methods

CUTANEOUS CIRCULATION

effects of:

altitude, III: 2986

environmental temperature, IV: 4364

physical work, IV: 4364

relation to heat loss, I: 483; IV: 4869

CUTANEOUS RESPIRATION

tests, III: 3047

CYBERNETICS see Man-machine systems

CYCLES see Activity cycle; Cosmic ray cycle; Diurnal cycle; Lunar cycle. Also see entries under Rhythms

CYCLIZINE

use in motion sickness, III: 2860; IV: 4460

CYSTAMINE see Methenamine

DACORENE

effects on heart function, IV: 4329

DACTYLOGRAPHY see Fingerprinting

DARK ADAPTATION, I: 197, 198; II: 1825

bibliography, I: 703; II: 1274; IV: 4576

effects of:

altitude, II: 1963

anoxia, I: 141

color adaptation, III: 2996

drugs

ascorbic acid, II: 1458

carcholin, II: 1385

glycyrrhizin, IV: 4309

intermedin, IV: 4641

vitamin A, II: 1458

illumination, I: 200, 601; II: 1855; III: 3650

light stimuli, I: 864; II: 1387, 1427, 1779, 1825, 1854

preadaptation, I: 480; II: 945, 1853; IV: 4660, 4679, 5182

ultraviolet rays, II: 1900; IV: 5182

general physiological factors, IV: 4641

race factors, II: 1926

relation to:

age, IV: 4584

color vision, I: 499; II: 1122, 1855; III: 2412; IV: 4770

motion perception, II: 1593

peripheral vision, II: 1120

visual acuity, I: 294; II: 1157; III: 2660; IV: 4055

test methods, II: 2234; III: 3506

thresholds, IV: 4680

time factors, II: 1031, 1384; III: 2387, 2660; IV: 4680

DARK ADAPTATION GLASSES, II: 1387

evaluation, III: 2608

DAY-NIGHT CYCLE see Diurnal cycle

DAZZLE see Glare

DEAFNESS (Including partial deafness) (see also Auditory perception of partially deaf; see also items under Occupational deafness), I: 292, 428, 4[illegible] 840; II: 1203, 1704, 1730, 1731; III: 3008

caused by:

auditory stimuli, III: 2364

flight duty, III: 3053

general physiological factors, II: 1703; III: 3150, 3579

prevention, IV: 4108, 4480, 4899

relation to:

auditory fatigue, IV: 4140

speech intelligibility, III: 3305

treatment, IV: 4495

use of nicotinic acid, II: 1685

DEBRIS see Aircraft debris

DECELERATION see Acceleration

DECISION MAKING PERFORMANCE (see also Reasoning), III: 3688
relation to personality, IV: 3857
time factors, III: 2974
DECOMPRESSION see Altitude; Explosive decompression
DECOMPRESSION CHAMBERS, II: 1374, 2304, III: 2634, 2773; IV: 3916
animal experiments, III: 2649
handbooks and treatises, III: 3267
DECOMPRESSION SICKNESS (Aeroembolism, Bends) (see also Postdecompression shock), I: 269, 270, 453, 657; II: 1562, 2037; III: 3267; IV: 3993 4192, 4206, 4325
effects of physical work, III: 2433
etiology, IV: 3810
general physiological factors, II: 1758; IV: 5112
incidence, IV: 4301
prevention and treatment, I: 178; II: 1561; III: 2605, 2913; IV: 3810
relation to:
age, I: 270
body weight, I: 270
DEHUMIDIFICATION see entries under Air conditioning
DEHYDRATION
caused by hot climates, IV: 4525
treatment, IV: 4524
DELINQUENCY see Attitudes
DENITROGENATION see Nitrogen elimination
DENMARK see under Aviation medicine
DENTAL ANOMALIES
general physiological effects, III: 3632
relation to aerotitis media, II: 2244
DENTAL CARE, I: 532; II: 1359; III: 2981, 3010; IV: 4695
DENTAL DISTURBANCES; IV: 4695
caused by altitude, I: 48, 871; IV: 4017, 4429
relation to:
airplane flight, II: 1788; III: 2571
personality, II: 1787; III: 3167; IV: 4607
statistics, II: 1788
DENTAL EXAMINATION, III: 3166
DENTAL PLATES see Dental prostheses
DENTAL PROSTHESES
effects on speech, II: 977
DENTAL REQUIREMENTS see under Pilots
DENTAL SERVICE
administrative and organizational aspects, IV: 4042
DEODORANTS
evaluation, IV: 4942
toxic effects, I: 366, 367
DEODORIZATION see under Cabins
DEPRIVATION see Human isolation; Sensory deprivation; Sleep deprivation; Starvation; Water deprivation
DEPTH OF FOCUS see under Visual perception
DEPTH PERCEPTION, I: 219, 244, 374, 790; II: 2116; III: 2813
effects of:
alcohol, I: 242
anoxia, I: 242; II: 1661; IV: 3929
colors, II: 1209
contact lenses, I: 85, 87, 219
fatigue, IV: 4892
heterophoria, IV: 4064, 4315
hyperoxia, IV: 3929
illumination, II: 1353, 2009, 2014; III: 3232, 3409
motion, II: 1450, 2222
noise, II: 1068
periscopes, IV: 4112
posture, III: 2675
training, IV: 4221
visual cues, III: 2579
visual stimuli, II: 1452
in binocular vision, II: 975, 1068, 1211, 1233, 1315, 1901; III: 2672, 2673, 2811, 2812, 2979, 3268, 3481, 3532, 3538, 3684; IV: 3962, 4067, 5047
in monocular vision, I: 301, 740; II: 1068, 1211, 1233, 1451, 2115; III: 2979, 3538, 3684; IV: 5047
physical factors, III: 2694; IV: 5047
psychological factors, I: 84; II: 979, 1579, 1580, 1617
relation to:
accidents, I: 249; II: 2059
brightness discrimination, III: 3232; IV: 4000
emmetropia, IV: 4841
head movements, II: 1068
ocular dominance, II: 1533, 1821
peripheral vision, III: 2671
pilot performance, IV: 4134
retinal adaptation, I: 434; II: 2187; III: 3409
size perception, II: 1464, 1465; III: 2849, 3100; IV: 4227, 4228
visual acuity, III: 2979; IV: 5047
role of:
eye movements, IV: 4529
test methods, I: 461, 674; II: 980, 1929; III: 3480
tests, II: 1463; IV: 4134, 4649
DEVELOPMENT see under Ear; also see Embryonic development
DEXEDRINE see Amphetamine

DIALS see Instrument dials

DIAMOX
effects on:
anoxia tolerance, IV: 3933
carbon dioxide elimination, II: 1060; III: 2573

DIATRIN
use in motion sickness, I: 231

DIBENAMINE
effects on:
altitude tolerance, I: 122
anoxia tolerance, I: 321
respiration, I: 321

DIBENZYLENE
use in motion sickness, I: 236

DIET (see also Food; Liquid diets)
effects on:
altitude tolerance, III: 2629
carbohydrate metabolism, IV: 4139
liver metabolism, IV: 4809
metabolism, III: 2560, 3278, 3499
nitrogen metabolism, III: 2562
physical fitness, II: 1848; III: 2990, 3343
survival, III: 3016; IV: 4471
water intake, II: 1674
work capacity, III: 2901
relation to:
altitude acclimatization, IV: 4254

DIETARY REQUIREMENTS see Nutritional requirements

DIFFUSION see under Respiratory gases

DIGESTIVE SYSTEM see Digestive system function; Flatus; Liver; Peptic ulcer; Salivary glands

DIGESTIVE SYSTEM FUNCTION (see also Appetite; Pancreatic rhythm)
effects of:
altitude, I: 267, 513, 798, 799; II: 1265, 2092; IV: 5004
anoxia, II: 1386, 1982, 1983
explosive decompression, II: 2209
negative acceleration, III: 3122
solar radiation, I: 267; II: 1265
tetraethylammonium chloride, II: 1386
glucose absorption, I: 267; II: 1265

DIHEXYVERINE
effects on:
altitude tolerance, IV: 4176

DIISOPROPYL FLUOROPHOSPHATE
effects on:
electrical potentials of cochlea, I: 839
labyrinth, III: 3373

DIMENHYDRINATE (Dramamine, Etanautine, Nautamine, Novamine)
effects on:
anoxia tolerance, I; 821, 823; III: 3350
auditory perception, II: 1389; III: 3661
mental performance, I: 689; II: 1917
nystagmus, III: 3373
visual perception, II: 1389
general psychological effects, II: 1890
use in motion sickness, I: 84, 89, 142, 156, 236, 293, 333, 336, 689; II: 1509; III: 3160; IV: 4317, 4460

DIPARCOL
use in motion sickness, I: 236

DIPHENHYDRAMINE HYDROCHLORIDE see Benadryl

DIPHENYLHYDANTOIN
effects on anoxia tolerance, II: 1400

DIPHTHERIA
control, I: 772

DIPLOPIA (see also Heterophoria)
relation to heterophoria, III: 2464

DISABILITY see Physical fitness

DISCIPLINE see entries under Attitudes

DISCRIMINATION see Brightness discrimination; Loudness discrimination; Pattern discrimination; Pitch discrimination; Probability discrimination; Tactile discrimination; Velocity discrimination

DISEASES (see also Aerotitis; Arthritis, Cardiovascular diseases; Communicable diseases; Epilepsy; Eye diseases; Infectious diseases; Intestinal diseases; Malaria; Mental diseases; Poliomyelitis; Respiratory diseases. See Also entries under Occupational diseases and Sicknesses. See also Pathology under organs and organ systems)
effects on performance of aviators, III: 3607
incidence in personnel, IV: 4089

DISORDERS see Speech disorders. Also see items under Abnormalities; Disturbances

DISORIENTATION see Spatial orientation

DISPLAY-CONTROL SYSTEMS
effectiveness, IV: 4199

DISPLAYS see Visual displays

DISPOSAL see under Feces; Urine; also see subdivision Removal

DISTANCE ESTIMATION (see also Depth perception
tests, IV: 4833

DISTURBANCES see Dental disturbances. Also see under Spatial orientation, Vision; also see Diseases; Sicknesses; and subdivisions Abnormalities; Disorders; Pathology

DITCHINGS (see also Accidents)
statistics, IV: 4062, 5099

DIURNAL CYCLE
effects on blood cells, II: 1461
general physiological effects, I: 812, 814
relation to:
biological rhythms, III: 2530, 2542, 2961; IV: 3895, 4105, 4990, 5030
activity rhythm, III: 2402, 3013, 3154; IV: 3746, 4169, 4799
adrenal activity rhythm, IV: 4294
autonomic nervous activity rhythm, IV: 4242
excretory rhythm, III: 3086; IV: 4643, 4655
galvanic skin response rhythm, IV: 4890
pulse rate rhythm, IV: 4353
respiratory rhythm, IV: 4353
sleep, III: 3012
carbohydrate metabolism, III: 3020
epinephrine excretion, IV: 4127
fatigue, II: 1165; IV: 4180
iron metabolism, IV: 3868
mental performance, IV: 3846
water exchange, III: 3194
work capacity, III: 2530
DIVING FLIGHT
medical problems, IV: 4951
DOMINANCE see Handedness; Ocular dominance
DONAGGIO REACTION see Physical work, effects on urine composition
DRAMAMINE see Dimenhydrinate
DREPANOCYTEMIA see Sicklemia
DRINKING see Alcohol; Water intake
DRINKING WATER see Water supply
DRUG ACTION
effects of:
altitude, I: 863; II: 953; III: 3106; IV: 4696
anoxia, I: 108, 275, 863; II: 1815; III: 2628
barometric pressure, II: 1205
carbon dioxide, IV: 4457
DRUGS (see also Anesthetics; Antihistaminics; Hypnotics; Motion sickness drugs; Narcotics; Pyrogenic agents. See also individual drugs: Acetylsalicylic acid; Adenosine monophosphate; Alcohol; Amino acids; Aminophylline; Aminopyrine; Amphetamine; Androsterone; Antistine; Aramine; Atropine; Banthine; Barbituric acid derivatives; Benadryl; Bentyl; Buscopan; Caffeine; Carcholin; Centropnein; Chlorophyll; Chlorpromazine; Cobalt compounds; Cocaine; Codeine; Cortisone; Cyclizine; Dacorene; Diamox; Diatrin; Dibenamine; Dibenzylene; Dihexyverine; Diisopropyl fluorophosphate; Dimenhydrinate; Diparcol; Diphenylhydantoin; Ephedrine; Epinephrine; Ergotamine; Folic acid; Glycyrrhizin; Heparin; Hesperidin; Histamine; Hydergine; Intermedin; Isophenergan; Lergigan; Lisergan; Meclizine; Meperidine; Mescaline; Methadone; Methenamine; Metrazol; Morphine; Mosidal; Multergan; Neostigmine; Nicotine; Nicotinic acid; Nikethamide; Nitrites; Opium; Parsidol; Phenergan; Physostigmine; Pilocarpine; Postafene; Primaquine; Probanthine; Procaine; Progesterone; Promethazine; Purine; Pyribenzamine; Pyridine; Pyridoxine; Pyrrolazote; Quinine; Rutin; Salyrgan; Scopodex; Scopolamine; Sodium azide; Soventol; Succinates; Sulfonamide compounds; Terramycin; Tetraethyl pyrophosphate; Tetraethylammonium chloride; Thephorine; Thiamine; Vasopressin; Veratrine; Vitamins; Vomex A)
contraindication for aviators, III: 2831; IV: 4248
effects on:
altitude tolerance, I: 122
anoxia tolerance, I: 608, 821, 823; II: 1400; III: 2488
blood pressure, I: 196, 608, 719; IV: 3888
circulation, I: 196, 719
color vision, II: 2297
electroretinogram, II: 1882
fatigue, II: 1915; IV: 3954; 4394
heart metabolism, III: 3525
heterophoria, IV: 3836
hyperoxia tolerance, IV: 4215
neuromuscular performance, III: 2898
nystagmus, III: 3115
oxygen consumption, III: 2434
psychomotor performance, II: 1549; III: 2843, 2900, 3295
respiration, II: 1202
retention of messages, IV: 4762
temperature regulation, III: 2434; IV: 3887
inducing hypothermia, III: 2983; IV: 3906
DUMMIES, I: 52; II: 919; III: 3119
DUODENAL ULCER see Peptic ulcer
DUTIES see Flight duty. Also see Duties under the various personnel categories, e.g., Flight surgeons, duties
DYNAMIC VISUAL ACUITY, II: 1750, 1830; IV: 4566
effects of training, III: 3126; IV: 4565
DYSBARISM see Altitude sickness; Decompression sickness; Dental disturbances caused by altitude. Also see entries under Barotrauma
EAR (see also External ear; Labyrinth; Middle ear)
anatomy, I: 93; II: 2028; IV: 4590
handbooks and treatises, III: 3628
development, I: 93
effects of:
airplane flight, IV: 4862
blast, II: 1008, 1329, 2199
sound, II: 1453
ultrasonic vibrations, II: 1865
examination see Hearing, test methods
pain, II: 1453
caused by noise, IV: 4864

pathology (see also Aerotitis media; Otitis externa), I: 292, 567; III: 3079, 3183; IV: 4590

physiology (see also Hearing), I: 93; IV: 4496, 4590, 5206

handbooks and treatises, III: 3628

pressure gradient

effects on auditory perception, IV: 4312

EAR DEFENDERS (see also Ear muffs; Ear plugs; Helmets, acoustical properties), II: 941, 1935; III: 2305, 2424, 2972, 2973, 3052, 3162, 3244; IV: 3974, 4022, 4322, 4473, 4480, 4646, 4787, 4827, 5115, 5140, 5175

evaluation, IV: 4625, 5015

EAR MUFFS, II: 1285, 1454, 1637, 1813; III: 2664

EAR PLUGS, I: 383, 487, 552, 615; II: 1285, 1329, 1425, 1454, 1637, 1795, 1813, 1871, 2301, 2302, 2303; III: 2664; IV: 4226, 4383, 4419, 5170, 5207

effectiveness, II: 1380, 1700; III: 3558

effects on speech intelligibility, II: 1872

EARPHONES

effects on auditory perception, IV: 5205

EATING see Food intake

ECOLOGICAL SYSTEMS see Closed ecological systems

EDIBLE PLANTS, IV: 4307

EJECTION SEATS, I: 172, 359, 543, 744, 749, 809; II: 924, 928, 1249, 1330, 1382, 1554, 1555, 1844, 2034; III: 2879, 2909, 2910, 3274, 3314; IV: 3859, 3928, 3966, 4107, 4190, 4335, 4382, 4406, 4546, 4616, 4845, 4846, 4847, 4895, 4902, 5100

evaluation, IV: 4461

hazards, II: 1212; III: 2330; IV: 4452, 4996

ELECTRICAL POTENTIALS see under Cochlea; Labyrinth. Also see Standing potential; and entries under Action potentials

ELECTRICAL RESISTANCE see Galvanic skin response

ELECTRICAL STIMULI

effects on:

eye, II: 2079; III: 2531

labyrinth, II: 1010, 1665

muscular function, II: 1490

pulse rate, IV: 5142

ELECTRICIANS

performance

test methods, IV: 4955

training, III: 2356

ELECTROCARDIOGRAM (see also Electrocardiography), II: 1906; III: 3275, 3325

abnormalities, III: 3168; IV: 4807

effects of:

airplane flight, II: 1942

altitude, IV: 3805

altitude acclimatization, IV: 3723

anoxia, I: 884; II: 981, 1945, 2283; III: 2344, 2505, 2508, 2818, 3381; IV: 3699, 4059, 4237, 4238, 4288

carbon dioxide, I: 884

cold, IV: 4486

drugs

atropine, I: 392

nicotine, III: 2344

vasopressin, IV: 3699

vitamin E, III: 2818

fatigue, IV: 4807

food intake, IV: 4493

heat, III: 3542

hyperoxia, I: 607, 884; III: 3530

hypothermia, IV: 4003, 4004, 4599

nasal stimulation, II: 2285

oxygen breathing, I: 607; IV: 4247

physical work, III: 3683; IV: 4486

piloting, II: 1457

positive acceleration, I: 720

pressure breathing, I: 452, 607

rotation, III: 3060

tobacco, III: 2344

tumbling, IV: 5149

Valsalva maneuver, II: 1210

vestibular stimulation, III: 3488

relation to:

electroencephalogram, IV: 5189

physical fitness, III: 3050

ELECTROCARDIOGRAPHY

in flight, II: 1457; III: 2320

ELECTRODERMAL RESPONSE see Galvanic skin response

ELECTROENCEPHALOGRAM (see also Electroencephalography), IV: 5189

effects of:

anoxia, I: 282, 413, 821, 823, 906; II: 1591, 2112, 2120, 2121, 2279; III: 2469, 2505, 2976, 3335; IV: 4011, 4749

antihistaminics, IV: 4716

auditory stimuli, III: 3199

caffeine, IV: 4716

carbon dioxide, I: 758; II: 2058; III: 3431

explosive decompression, II: 1419

hyperoxia, III: 2454, 3170; IV: 4144

hyperventilation, II: 1168, 2282; III: 3316, 3431; IV: 5189

hypocapnia, II: 1591

hypothermia, III: 2556, 2730; IV: 4144, 4145, 4932

light stimuli, I: 853, 906; II: 1168, 2112, 2202, 2203, 2204; III: 2855, 3572, 3573
Metrazol, II: 1168
nasal stimulation, II: 2285
noise, II: 2225; III: 2553, 2566
rotation, III: 3060
vestibular stimulation, II: 2299; III: 3687
relation to:
age, I: 282
alertness, II: 1659
anxiety proneness, I: 853; II: 2204
carbohydrate metabolism, IV: 5189
electrocardiogram, IV: 5189
personality, IV: 4792
pulse rate, II: 1591
sleep, III: 2855

ELECTROENCEPHALOGRAPHY, II: 2284; III: 3594, 3665; IV: 3908, 5188

ELECTROLYTE DISTRIBUTION (see also Potassium metabolism; Sodium metabolism; see also Electrolyte content under Blood)
effects of:
anoxia, IV: 4736
hyperventilation, IV: 4736
hypothermia, IV: 4736

ELECTROMYOGRAM
effects of:
carbon dioxide, I: 758
noise, II: 2044
respiration, II: 1193, 1194
ultrasonic vibrations, III: 2762
visual searching, II: 2044
relation to alertness, II: 1659, 2044

ELECTRONIC EQUIPMENT (see also Radar equipment; Radio equipment), III: 2358
human engineering, III: 3207; IV: 4291
use in:
aviation medicine research, IV: 4905
piloting (see also Instrument flight), II: 1953, 1954, 1955, 2084, 2289; IV: 4291

ELECTRONICS TECHNICIANS
performance
test methods, II: 1371, 1495
selection, II: 1493; IV: 5057
training, III: 2348, 2349, 2352; IV: 3702

ELECTRONYSTAGMOGRAM see Labyrinth, electrical potentials

ELECTRO-OCULOGRAM, IV: 3748
effects of:
retinal adaptation, IV: 4065

ELECTROPHONIC HEARING, I: 344, 722

ELECTROPHRENIC RESPIRATION, I: 400; III: 2830

ELECTRORETINOGRAM, II: 991, 2278
effects of:
anoxia, II: 2112; IV: 4749
drugs, II: 1882
light stimuli, II: 1796, 2112
positive acceleration, IV: 4532
retinal adaptation, II: 1135
in blackout, IV: 4532
relation to visual perception, IV: 4854

ELIMINATION see Carbon dioxide elimination; Nitrogen elimination. Also see items under Disposal; Removal

EMBRYONIC DEVELOPMENT
effects of altitude, I: 512

EMERGENCIES see Radio equipment for emergencies

EMERGENCY HOSPITALS
equipment, I: 600

EMERGENCY PRESSURE CELLS, III: 2605

EMERGENCY RATIONS, III: 2392, 2483, 2903, 2928, 3014, 3016, 3343, 3346, 3347, 3416, 3484, 3640; IV: 4471, 4804, 4896, 4897
bibliography, IV: 4023

EMERGENCY RESCUE see Air evacuation; Rescue

EMETIC CENTER see Vomiting center

EMMETROPIA
relation to depth perception, IV: 4841
statistics, IV: 4063

EMOTIONAL STRESS see Mental stress

EMPTY VISUAL FIELD
effects on visual accommodation, IV: 4351
ocular convergence, IV: 4404

ENDOCRINE SYSTEM (see also Adrenal glands; Hypophysis; Thymus; Thyroid)
effects of:
altitude, I: 345; III: 3411
noise, II: 1174, 1176
ultrasonic vibrations, II: 1174
vibration, II: 1176
effects on biological rhythms, IV: 4852
role in:
hyperoxia, IV: 4972
temperature regulation, I: 345

ENDOCRINES see Hormones

ENDOGENOUS FORMATION see under Carbon monoxide

ENERGY EXPENDITURE see Metabolism

ENGINE NOISE (see also Jet engine noise)
analysis, II: 1455, 2040; III: 3254; IV: 4438
effects on:
adrenal glands, I: 449
hearing, I: 383, 641; IV: 4419
general physiological effects, III: 2519

reduction, II: 1390, 1553

ENGINE OILS

hazards, II: 1786

toxic effects, III: 2499

ENGINEERING see Human engineering. Also see Engineering factors under Accidents

ENGINES see Turbojet engines

ENVIRONMENT see Space environment

ENVIRONMENTAL FACTORS (see also under Accidents; see also specific environmental factors, e.g., Cold)

effects on biological rhythms, IV: 3747

ENVIRONMENTAL TEMPERATURE (see also Cold; Heat; see also subdivision Temperature)

effects on:

activity rhythm, III: 3462

altitude tolerance, I: 122

anoxia tolerance, I: 122; II: 1307, 1520

circulation, III: 2366; IV: 3815

comfort, III: 2313

cutaneous circulation, IV: 4364

lipid metabolism, IV: 4728, 5196

nitrogen metabolism, IV: 5197

nutritional requirements, IV: 4809

oxygen consumption, III: 2434

perspiration, II: 1563, 1564, 1565, 1766, 1767; IV: 4975

psychomotor performance, II: 1918, 1919, 1920; III: 3540

temperature regulation, II: 1204; III: 2669

urine composition, IV: 5197

vigilance, II: 1922

general physiological effects, II: 1921; IV: 4819

ENZYME ACTIVITY

effects of:

cosmic rays, IV: 4123

ionizing radiations, I: 338

role in:

cold tolerance, III: 2512

hyperoxia tolerance, III: 2800

ENZYMES see Carboxypeptidase; Catalase; Cholinesterase; Lipase

EOSINOPHILS see Blood cells

EPHEDRINE AND DERIVATIVES (Pervitin, Rhinalgan)

effects on:

congestion of nasal passages, I: 566

night vision, III: 2836

use in altitude sickness, III: 3643

vasoconstrictor effects, I: 566

EPIDEMIOLOGY see Communicable diseases

EPILEPSY, II: 2281

caused by intermittent light, III: 2328

general psychological effects, III: 3667; IV: 5190

predisposition

test methods, IV: 4568

EPINEPHRINE AND RELATED DRUGS

effects on:

blood pressure, III: 2825

oxygen consumption, II: 2239

pulse rate, III: 2591

respiration, II: 2239; III: 3084

visual perception, II: 1393

excretion see Epinephrine excretion

EPINEPHRINE EXCRETION

effects of:

airplane flight, III: 2718

posture, IV: 4128

relation to diurnal cycle, IV: 4127

EQUILIBRIUM

effects of:

anxiety, II: 1609

fatigue, II: 1608, 1609

menstruation, II: 2038

relation to labyrinth, II: 1665, 1876; III: 3339

role in piloting, IV: 4863

test methods, III: 3061

tests, I: 333, 336; II: 1010

EQUIPMENT see under Ambulance planes; Bailout; Bailout at high speed; Blood transfusion; Emergency hospitals; Human centrifuges; Pursuit tracking; Survival; Survival on land; Survival on water. Also see Electronic equipment; Navigational equipment; Protective equipment

ERGOTAMINE AND RELATED DRUGS (Gynergen)

effects on anoxia tolerance, II: 1400

ERYTHROCYTES see Blood cells; Hemoglobins

ESCAPE CAPSULES, I: 53, 359, 622, 692; II: 928; IV: 4190, 4331, 5089, 5131

ESCHERICHIA COLI, II: 1538

ESERINE see Physostigmine

ESTRUS see Reproductive system

ETANAUTINE see Dimenhydrinate

ETHANOL see Alcohol (Ethyl)

ETHYL ALCOHOL see Alcohol (Ethyl)

EUROPE see under Air transportation of patients

EUSTACHIAN TUBE see Middle ear

EVACUATION see Air evacuation

EVOLUNTIONARY ASPECTS see under Anoxia tolerance

EXAMINATION see Dental examination; Neuropsychiatric examination; Physical examination. Also see under Autonomic nervous system; Cardiovascular system; Eye; Heart; Labyrinth; Liver; Middle ear; Spinal column; Spleen

EXCREMENTS see Feces

EXCRETION see Aldosterone excretion; Epinephrine excretion; Steroid excretion

EXCRETORY RHYTHM
relation to diurnal cycle, III: 3086; IV: 4643, 4655

EXERCISE see Physical work

EXPEDITIONS see Planetary expeditions

EXPIRED AIR see Respiratory gases

EXPLOSIONS see Atomic explosions; Blast

EXPLOSIVE DECOMPRESSION, IV: 4206, 5122
analysis, II: 1513
effects on:
abdominal pressure, IV: 3774
alveolar carbon dioxide tension, II: 2130
alveolar oxygen tension, II: 2130; III: 2515
blood, I: 529; II: 1653
blood pressure, II: 2023; IV: 3774
blood temperature, II: 2210
body gases, II: 2218
brain, I: 418
circulation, I: 214, 529, 868, 869; II: 1428, 1574, 1653, 2248
digestive system function, II: 2209
electroencephalogram, II: 1419
hearing, IV: 4299
heart, II: 2208
heart function, I: 214; II: 1179
intracranial pressure, II: 2247
intrapulmonary pressure, IV: 4571
lung, I: 418, 623, 855, 856, 868, 869; II: 1432, 1656, 2208, 2249; III: 2597, 2891, 3340, 3592; IV: 4319
lung temperature, II: 2210
memory, III: 3135
middle ear, III: 3065
respiration, II: 1477
tissue pressure, I: 530; II: 1654
general physiological effects, I: 260, 324, 503, 506, 530, 586; II: 1349, 1350, 1477, 1577, 1652, 1654, 1656, 2035, 2246; III: 2321, 2933, 2998, 3107, 3127, 3589, 3591; IV: 3781, 4362, 5110
general psychological effects, III: 2321
pathological effects, IV: 4073, 4172, 4300
physical factors, III: 3590
protection, I: 503, 506; II: 1107, 1754; IV: 3698, 3753

EXPLOSIVE DECOMPRESSION TOLERANCE, II: 1577, 1657, 2138, 2246; III: 3436

EXPOSURE SUITS (see also Ventilated suits), II: 925, 1524; III: 2323, 2599, 2875; IV: 4206
evaluation, II: 958, 1525

EXTERNAL EAR
pathology (see also Otitis externa), II: 2082

EYE (see also Ocular rhythms; Pupil size; Pupillary reactions; Retina; Vision; Vitreous humor; see also subdivision, Visual requirements)
diseases see Eye diseases
dominance see Ocular dominance
effects of:
anoxia, II: 1661
blast, III: 3386
electrical stimuli, II: 2079; III: 2531
ionizing radiations, II: 1638
ultrasonic vibrations, II: 1706
electrical potentials see Electro-oculogram; Electroretinogram
examination (see also Vision, test methods), I: 137, 140, 218, 895; II: 2274; IV: 4188, 4430, 4767, 4979
movements see Eye movements
pathology, IV: 4765
physiology, III: 3414

EYE DISEASES
caused by airplane flight, III: 3300
handbooks and treatises, II: 1924
relation to nasal passages pathology, III: 3378

EYE MOVEMENTS (see also Eye tremor; Nystagmus), II: 1005; III: 2957; IV: 5029
caused by tilting, II: 1768, 1769
effects of:
acceleration, III: 3057
light stimuli, II: 1444
in piloting, I: 325, 646, 647, 648; III: 2603, 2674; IV: 5135
in radar operation, I: 370
measurement, III: 2674, 3368
relation to:
retinal adaptation, IV: 3748
visual perception, III: 3124
role in:
depth perception, IV: 4529
size perception, III: 2957
time factors, III: 2674, 2795

EYE PROTECTION, IV: 4043

EYE TREMOR, II: 1310
relation to visual acuity, II: 1987; III: 3368

EYEGLASSES see Spectacles

FAINTING
caused by physical work, IV: 4494
general physiological factors, II: 1679; III: 3334; IV: 4193, 4370, 5152
psychological factors, II: 1679; III: 3334
relation to muscular tonus, IV: 4494

FALL see Free fall

FALLING OBJECTS see Aircraft debris; Meteorites

FASCINATION, II: 1237, 1239; IV: 3973
  cause of accidents, II: 2059

FAT METABOLISM see Lipid metabolism

FATIGUE (see also under Sweat glands. See also Auditory fatigue; Mental fatigue; Muscular fatigue; Visual fatigue)
  caused by:
    airplane flight, I: 77, 889; III: 3043, 3139, 3156, 3668; IV: 4180
    flight duty, I: 77; II: 1800, 1843; III: 2691, 2720, 2987, 2988; IV: 4879
    heat, III: 2463
    hot climates, III: 2708
    noise, II: 1127; III: 2971
    physical exercise, III: 3570
    physical work, III: 3229
    stress, II: 1691
  congresses, meetings, and symposia, III: 2741
  effects of:
    drugs, II: 1915; IV: 3954, 4394
      amino acids, III: 3213
      amphetamine, II: 1915; IV: 4323, 4757, 4758, 4760
      androsterone, IV: 4879
      Benadryl, IV: 4757
      caffeine, IV: 4323
      scopolamine, IV: 4757
  effects on:
    blood cells, II: 1461
    brightness discrimination, IV: 3767
    cerebral circulation, IV: 4606
    depth perception, IV: 4892
    electrocardiogram, IV: 4807
    equilibrium, II: 1608, 1609
    finger tremor, II: 1991; III: 2695
    flicker fusion frequency, II: 1609; III: 2558, 2834, 3394; IV: 4737, 5129
    mental performance, IV: 4416
    metabolism, IV: 3789
    neuromuscular performance, III: 3394
    olfactory perception, II: 2254
    pulse rate, III: 3515
    pupillary reactions, III: 3121
    reaction time, II: 1645; III: 3163
    reasoning, II: 1760
    speech intelligibility, II: 2232
    visual perception, II: 1293, 1759, 1760; III: 3132
    work capacity, III: 2431, 2432
  general physiological effects, III: 3668
  general physiological factors, II: 1130, 1341, 1638, 1797; III: 3192
  general psychological effects, III: 3139, 3668
  in fighter plane piloting, II: 1341, 1375
  in helicopter flight, IV: 4021
  in jet plane piloting, I: 628; II: 1075, 2262; IV: 5129
  in mental performance, II: 1646
  in physical work, II: 1282, 1883; III: 3570
  in piloting, I: 33, 77, 326; III: 2329, 3229; IV: 4030
  in psychomotor performance, II: 1048, 1129, 2105; III: 2532, 2899, 2900, 3456; IV: 4323, 4757, 4758, 4760, 4953
  in radar operation, I: 370; II: 2005; III: 2466
  in traffic control operation, III: 3460
  in vigilance, I: 352; II: 2255, 2256; III: 2532; IV: 3767
  measurement, II: 1608, 1609, 1759, 1760; III: 2396, 2397, 2558, 2722, 2834, 3147, 3449, 3515
  psychological factors, II: 1341, 1772; III: 3449
  relation to:
    anoxia, II: 1325
    diurnal cycle, II: 1165; IV: 4180
    muscular tonus, II: 2253
    sleep deprivation, II: 1165, 1760
    visual illusions, II: 1759
  research, II: 1903
  reviews, II: 1130
  role of:
    adrenal glands, II: 1690, 1797
    hypophysis, II: 1797

FATS see Body fat; Lipids

FEAR see Anxiety

FECES
  disposal, IV: 4596

FEEDBACK see Information feedback; Speech feedback

FEEDING see Flight feeding; Food; Food intake; Space flight feeding; Starvation. Also see Nutrition under Air crews; Space crews

FEMALES see Instructors (Female); Sex factors

FERTILITY
  effects of:
    altitude, I: 11
    altitude acclimatization, IV: 4663
    carbon tetrachloride, I: 11

FEVER (see also Hyperthermia; Scarlet fever)
  effects on air transportability, IV: 4485

FIELD OF VISION see under Airplane flight: Prone position flight. Also see Empty visual field

FIGHTER PLANE PILOTING
  fatigue, II: 1341, 1375

FILLINGS see Tooth fillings

FILMS see Motion pictures

FILTERS see Acoustical filters; Optical filters

FINGER TREMOR
effects of:
anxiety, II: 1991
fatigue, II: 1991; III: 2695
noise, IV: 4551
vibration, IV: 4551

FINGERPRINTING, I: 279

FIRE EXTINGUISHING AGENTS (see also Methyl bromide)
toxic effects, I: 263; IV: 4806

FIRE PROTECTION, I: 465

FIRE PROTECTIVE CLOTHING, III: 2416

FIRE RESCUE, I: 696, 843; II: 1928

FIRST AID see under Blast injuries; Crash injuries

FITNESS see Neuropsychiatric fitness; Physical fitness

FLACK TEST, II: 2003, 2004; III: 3272
effects on blood pressure, III: 3326

FLASHING LIGHTS see Signal lights (Flashing)

FLATUS
effects of altitude, I: 797, 799

FLICKER see Intermittent light

FLICKER FUSION FREQUENCY
effects of:
alcohol, III: 3385
anoxia, III: 2480, 3385
anxiety, II: 1609; III: 3394
carbon dioxide, II: 2058; III: 3431
cold, III: 3537; IV: 5048
fatigue, II: 1609; III: 2558, 2834, 3394; IV: 4737, 5129
heat, IV: 4442
hyperventilation, II: 1615
mental stress, III: 2558
stress, II: 1167; III: 2396, 2397
measurement, II: 1615
reviews, I: 781, 782
use in heart examination, III: 3002

FLIERS see Aviators

FLIGHT see Airplane flight; Balloon flight; Flight duty; Helicopter flight; High speed flight; Instrument flight; Jet plane flight; Night flying; Prone position flight; Rocket flight; Space flight; Supine

FLIGHT DUTY (see also Airplane flight; Navigation; Piloting)
cause of:
anxiety, I: 21, 41, 767; II: 1435; III: 2719, 2763, 2781, 2782, 3092, 3593, 3595; IV: 5125
deafness, III: 3053
fatigue, I: 77; II: 1800, 1843; III: 2329, 2691, 2720, 2987, 2988; IV: 4879
effects on:
blood cells, IV: 4072
blood lipid content, IV: 4218
blood pressure, III: 3399
body weight, II: 1875
heart, III: 2839; IV: 4259
general psychological effects, I: 41, 358, 767; IV: 4936
relation to:
neuroses, I: 590; II: 1437
peptic ulcer, III: 2639

FLIGHT FEEDING (see also Airplanes, kitchen facilities; Liquid diets), I: 35, 69, 415, 484; III: 3312, 3584; IV: 3770, 4479, 4768, 4802
in high altitude flight, IV: 4366

FLIGHT HELMETS see Helmets

FLIGHT NURSES
duties, II 970, 1709; IV: 4507
personality, II: 1709
training, I: 2, 25; III: 3685

FLIGHT SIMULATORS (see also Helicopter flight simulators; Jet plane flight simulators; Space flight simulators; see also entries under Centrifuges), I: 706; II: 1409, 1568, 1802; III: 2357, 2528, 3298, 3562, 3651, 3654; IV: 3832, 3916, 4020, 4045, 4178, 4235, 4285, 4286, 4620, 4706, 4793, 4961, 5006
evaluation, IV: 5058
human engineering, II: 1351; III: 3652

FLIGHT SURGEONS

FLIGHT SURGEONS
Australia, I: 68
certification, I: 18, 796; II: 929, 933, 1069; IV: 3790, 3941, 5101
duties, I: 30, 32, 186, 190, 299, 522, 524, 673, 787, 789; II: 1571, 1729; III: 2639, 3465, 3561, 3639; IV: 3878, 4161, 4258, 4511, 4667, 4711, 4782, 4783, 4991, 5022, 5168
Korean campaign, II: 2124; IV: 4570
role in air evacuation, III: 3639
training, I: 6, 7, 13, 17, 58, 102, 635, 789, 796; II: 933, 2067, 2142; III: 3155, 3531; IV: 3760, 5020
Brazil, IV: 3790

FLIGHT TRAINERS see Flight simulators; Piloting, training devices; Training planes

FLUID DISTRIBUTION see Body fluids, distribution

FLUIDS see Body fluids; Hydraulic fluid: Water exchange

FLYING ABILITY
relation to personality, IV: 4168
test methods, I: 328, 402, 516, 606, 891
FLYING PERSONNEL see Aviators
FLYING SUITS see Altitude suits; Anti-g suits; Space suits; Ventilated suits
FOLIC ACID
effects on anoxia tolerance, III: 2647
role in hematopoiesis, III: 2367
FOLLOW-UP STUDIES see under Aviators, occupational deafness; Hearing; Heart, examination; Physical examination
FOOD (see also Diet; Emergency rations; Flight feeding; Food intake; Space flight feeding; see also individual food items: Alcohol; Ascorbic acid; Carbohydrates; Folic acid; Nicotinic acid; Pyridoxine; Thiamine; Vitamin A; Vitamin B complex; Vitamin E)
preservation, I: 484
FOOD CONTAINERS, III: 2392; IV: 4366
FOOD DEPRIVATION see Starvation
FOOD INTAKE
effects of:
cold, IV: 4203
heat, IV: 4203
effects on:
electrocardiogram, IV: 4493
FOOD POISONING, IV: 4171
FOOT MEASUREMENTS, I: 655
FOOT PEDALS see Pedals
FOOTWEAR see Boots
FORM PERCEPTION (Shape perception), I: 372, 572
bibliography, I: 784
effects of:
illumination, II: 1218; III: 3031
instrumental magnification, III: 3206
physical factors; IV: 3876
relation to:
brightness discrimination, II: 1864
night vision, II: 1826
shape configuration, III: 2399
spatial orientation, IV: 3801
tests, II: 1423, 2110
thresholds, II: 1104; IV: 4641
time factors, IV: 3876
FOVEAL VISION, II: 1030, 1217
relation to:
color vision, II: 1177, 1607, 1620, 1939
night vision, II: 2046
thresholds, II: 1781
time factors, II: 989, 2158
FRANCE see under Aviation medicine; Medical personnel; Pilots, training
FREE FALL
general psychological effects, I: 351
FRENCH EAST AFRICA see under Air evacuation
FRENCH WEST AFRICA see under Aviation medicine
FREON see Organic solvents
FROSTBITE
prevention and treatment, I: 509; III: 3098
FUELS see Gasoline; Jet fuels; Kerosene; Rocket propellants
FUNCTION TESTS see under Cardiovascular system; Heart; Labyrinth; Lung; Middle ear
GAGES see Pressure gauges
GALVANIC SKIN RESPONSE
effects of:
chlorpromazine, IV: 3979
vestibular stimulation, IV: 3811, 4818
in instrument flight, IV: 4391
relation to:
adjustment to training, IV: 3845
GALVANIC SKIN RESPONSE RHYTHM
relation to diurnal cycle, IV: 4890
GAS BUBBLE FORMATION see under Blood; Tissues
GAS EXCHANGERS see Use as gas exchanger under Algae
GAS IN BODY CAVITIES (see also Body gases; Pneumothorax), III: 3267, 3657
effects on air transportability, I: 12, 215, 715
GASOLINE
toxic effects, I: 80, 730; III: 2377, 2427, 3183
GASTRIC SECRETION
effects of mental stress, III: 3153
GASTRIC ULCER see Peptic ulcer
GASTRODUODENAL ULCER see Peptic ulcer
GASTROINTESTINAL SYSTEM see Digestive system
GAUGES see Pressure gauges
GENERAL ADAPTATION SYNDROME, II: 1200, 1797; III: 2720
GENETIC EFFECTS see Biological effects under Cosmic rays; Ionizing radiations; Nuclear radiations
GEOGRAPHY see entries under Arctic; Cold climates; Hot climates; Mountains; Regional factors; Tropics. Also see under names of countries, e.g., United States
GERMANY see under Aviation medicine; Psychomotor performance, research

GLANDS see Adrenal glands; Hypophysis; Liver; Salivary glands; Sweat glands; Thymus; Thyroid gland

GLARE (Dazzle)
cause of accidents, II: 2059
effects on:
electromyogram, II: 2044
visual perception, I: 886; III: 3440
protection see Spectacles; Visors

GLASSES see Goggles and glasses

GLOVES, II: 978

GLUCOSE (see also Blood sugar)
absorption in digestive system, I: 267; II: 1265
effects on:
anoxia tolerance, I: 821, 823
respiration, II: 1433

GLUTAMINE METABOLISM
effects of anoxia, II: 2097

GLYCEMIA see Blood sugar

GLYCOGEN METABOLISM see Carbohydrate metabolism

GLYCYRRHIZIN AND DERIVATIVES
effects on:
anoxia tolerance, IV: 4309
dark adaptation, IV: 4309
mental performance, IV: 4309

GOGGLES AND GLASSES (see also Contact lenses; Dark adaptation glasses; Spectacles; Sunglasses; Visors
evaluation, III: 2609, 2687

GRAVITY see Acceleration; Subgravity

GREAT BRITAIN see under Air transportation of patients; Ambulance planes; Aviation medicine

GROUND CREWS (see also Maintenance personnel; Traffic control operators)
selection, III: 2650

GROUPS see Teams

GROWTH HORMONE see Somatropin

G-SUITS see Anti-g suits

GUIDANCE see Orientation and guidance under Medical personnel

GUIDANCE SYSTEMS see Instrument guidance systems

GUNNERS see Aerial gunners

GUNNERY see Aerial gunnery

GUNNERY CONTROLS
human engineering, II: 1486

GYNERGEN see Ergotamine

HABITUATION see Auditory habituation. Also see entries under Adjustment

HAND INJURIES
caused by parachute jumping, IV: 4746

HANDBOOKS AND TREATISES see under Aviation medicine; Aviators, training; Cold, general physiological effects; Decompression sickness; Ear, anatomy; Ear, physiology; Eye diseases; Human engineering; Night flying; Noise, measurement; Physical fitness; Pilots, training; Poisonous substances; Survival; Training. Also see entries under Reviews

HANDEDNESS
effects on psychomotor performance, III: 3474; IV: 4251

HARNESSES see Parachute harnesses; Safety harnesses

HAZARDS see under hazardous objects or actions, e.g., Aircraft debris, hazards; Bailout, hazards. Also see items under Occupational hazards

HEAD see Skull

HEAD INJURIES
caused by impact, IV: 4290
effects on air transportability, I: 215; IV: 4220, 5077

HEAD MEASUREMENTS, II: 1232

HEAD MOVEMENTS
relation to:
depth perception, II: 1068
motion sickness, I: 517, 518; II: 1629; III: 3338; IV: 4422, 4450
spatial orientation, II: 1404; IV: 4501

HEALTH see Neuropsychiatric fitness; Physical fitness

HEARING (see also Auditory perception; Binaural hearing; Bone conduction; Cochlea, physiology; Deafness; Electrophonic hearing; Monaural hearing), II: 1408
effects of:
aerotitis media, II: 1381
airplane flight, II: 1301, 1302, 1379; III: 3377
blast, I: 393; II: 1008
explosive decompression, IV: 4299
noise, I: 350, 383, 428, 542, 641, 743, 917; II: 941, 1171, 1175, 1302, 1304, 1536, 1537, 1592, 1594, 1685, 1704, 1730, 1775, 1871, 2027, 2042, 2068, 2102, 2175; III: 2663, 2972, 3078, 3094, 3161, 3162, 3404, 3419, 3420; IV: 3745, 3861, 3866, 4080, 4140, 4311, 4376, 4708, 4864, 4874
airplane noise, I: 28, 777; II: 1429, 1871; III: 2663, 3009, 3215, 3405; IV: 4496, 4717
engine noise, I: 383, 641; IV: 4419
helicopter noise (interior), IV: 4718
jet engine noise, I: 62, 743; II: 1871, 1935, 2049; III: 3420; IV: 4787
jet plane noise, I: 28; II: 1301, 1721, 1871, 1935; III: 2309; IV: 4785, 4787
sound, III: 2364, 3404; IV: 3714

ultrasonic vibrations, II: 1304; III: 2663

follow-up studies, IV: 4022, 4230

relation to:

age, II: 976, 2171; IV: 3861

electrical potentials of cochlea, I: 917; II: 1118, 1284; IV: 3715

test methods, I: 575, 816, 837; II: 940, 1182, 1303, 1309, 1378, 1539, 1664, 1688, 1703, 1934, 2192, 2231; III: 2524, 2563, 3019, 3282, 3621, 3649; IV: 3780, 3866, 4022, 4230, 4361, 4498, 4590, 5161, 5170, 5201

use of conditioned reflexes, II: 1664; III: 2862

HEARING REQUIREMENTS see under Aviators

HEART (see also Coronary circulation; Myocardiac tissue)

abnormalities

relation to altitude, I: 291; III: 2369; IV: 4614

effects of:

altitude, III: 3447

altitude acclimatization, I: 291; III: 3400; IV: 3804, 4881, 5053

anoxia, III: 2937, 3011; IV: 5108

explosive decompression, II: 2208

flight duty, III: 2839; IV: 4259

examination (see also Heart, function tests), I: 683; II: 1210, 1944, 1945, 1946; III: 3325, 3331

follow-up studies, III: 3275

use of flicker fusion frequency, III: 3002

function tests, III: 3324; IV: 4288

metabolism

effects of:

anoxia, I: 565; II: 1261, 1262, 1266, 1267; III: 2362, 2508, 2866, 3525

carbon dioxide, II: 1266

drugs, III: 3525

hypothermia, III: 3525; IV: 4002

pathology (see also Cardiovascular diseases)

cause of accidents, I: 9, 248

HEART FUNCTION (see also Ballistocardiogram; Electrocardiogram)

effects of:

abdominal pressure, II: 1512

altitude, II: 1944

alveolar carbon dioxide tension, II: 1154

anoxia, II: 1717; III: 3027, 3524, 3526; IV: 3750, 4444

blood carbon dioxide tension, IV: 4329

blood potassium content, IV: 3893

carbon dioxide, IV: 3893

Dacorene, IV: 4329

explosive decompression, I: 214; II: 1179

hypercapnia, III: 3526

hyperoxia, IV: 3750

hypocapnia, II: 1717

hypothermia, III: 2475, 2982; IV: 4005, 4329, 4709

physical work, II: 1945; IV: 5053

pressure breathing, II: 1657

rotation, II: 1347

test methods see Heart, function tests

HEART RATE see Pulse rate

HEAT (see also Hot climates; Thermal radiation)

acclimatization see Heat acclimatization

cause of fatigue, III: 2463

effects on:

adrenal glands, III: 2568, 3193; IV: 5041

aldosterone excretion, IV: 3985

ballistocardiogram, III: 3542

blood, I: 613; III: 2568, 2750, 2751, 3413; IV: 3834

blood cells, III: 2748, 3093; IV: 4302

blood plasma, III: 2989

blood pressure, IV: 3888

blood volume, III: 3093

body fat, I: 670

body temperature, III: 2892, 3675; IV: 3856

brain activity, III: 3502

circulation, IV: 3898

conditioned reflexes, III: 3502

electrocardiogram, III: 3542

flicker fusion frequency, IV: 4442

food intake, IV: 4203

hypophysis, IV: 5041

immunity to infectious diseases, IV: 4302

mental performance, II: 1047

metabolism, III: 2893

metabolism of organs

tissues, IV: 4410

metabolism of substances

chlorides, III: 2911, 3622

phosphorus, IV: 4439

perspiration, III: 2892, 3675; IV: 5052

pulse rate, II: 1520; III: 3675

reaction time, IV: 4179

respiration, IV: 4148

skin, I: 613

spleen, III: 2561

sweat composition, III: 2343, 2892, 2911; IV: 4468
tumbling tolerance, II: 1889
urine composition, III: 2569, 2906, 2989; IV: 4440
water exchange, III: 2341, 3330; IV: 4440
work capacity, III: 3220, 3256
X-ray tolerance, I: 686; IV: 4077
general physiological effects, I: 613, 670, 686; II: 1170; III: 2539, 2640, 2846, 2871, 3379; IV: 4487
pathological effects (see also Burns), IV: 4324
protection, II: 1170; III: 2323, 2341
tolerance see Heat tolerance

HEAT ACCLIMATIZATION, III: 3673, 3674
effects on:
anoxia tolerance, IV: 4350
heat tolerance, III: 2710
metabolism, IV: 3976
oxygen consumption, III: 2457
metabolism of organs
salivary glands, IV: 3986
thyroid gland, IV: 3986
metabolism of substances
iodine, IV: 3986
sweat composition, III: 2343
temperature regulation, III: 2457
general physiological effects, III: 2923, 3217, 3516, 3675; IV: 3792
role of adrenal glands, III: 2917

HEAT LOSS, I: 483
relation to:
cutaneous circulation, I: 483; IV: 4869
surface area, II: 1504

HEAT RADIATION see Thermal radiation

HEAT REGULATION see Temperature control

HEAT TOLERANCE, I: 825; II: 1170; III: 2501, 2502, 2624
effects of:
heat acclimatization, III: 2710
hyperthermia, III: 3676
sodium chloride, IV: 4487
vitamin B complex, III: 3014
water intake, IV: 4487
relation to metabolism, III: 2732
role of thyroid gland, III: 2435

HEATING see under Space cabins

HELICOPTER CABINS
atmosphere, IV: 4398

HELICOPTER FLIGHT
fatigue, IV: 4021
medical problems, II: 1324

HELICOPTER FLIGHT SIMULATORS, IV: 4182, 4332, 4357, 4367

HELICOPTER NOISE
analysis, IV: 4850
reduction, IV: 4850, 4957

HELICOPTER NOISE (INTERIOR), IV: 4850
effects on hearing, IV: 4718

HELICOPTER PILOTS
training, II: 1324; IV: 4332, 4333, 4357

HELICOPTERS (see also Ambulance helicopters)
use in:
air evacuation, I: 8, 16, 72, 302, 490, 528, 541, 580, 626, 897; II: 943, 1736, 2065; III: 2308, 2311, 2389, 2953, 3081, 3247, 3520; IV: 4699
air transportation of patients, III: 3313

HELMETS (see also Oxygen helmets; Pressure helmets; Visors), I: 523; II: 1232, 1630, 1989; III: 2307, 3354; IV: 4648, 5018
acoustical properties, I: 893; II: 2174; III: 2590, 2664
evaluation, II: 1016; III: 2686, 2687

HEMATOPOIESIS
effects of:
altitude, II: 999; III: 2367, 2473
anoxia, III: 2814
blood loss, II: 1904, 1905
conditioned reflexes, II: 2215
role of:
adrenal glands, IV: 4801
autonomic nervous system, II: 1904, 1905
chemoreceptors, IV: 5050
folic acid, III: 2367

HEMOGLOBINS
composition
effects of:
altitude acclimatization, III: 3581
carbon monoxide acclimatization, III: 3581
relation to:
age, III: 3580
anoxia tolerance, IV: 4308
sicklemia, IV: 4308
effects of nutrition, IV: 4012

HEMOLYSIN see Antibodies

HEMORRHAGE see Blood loss

HEMORRHOIDS, I: 638

HEPARIN
effects on blood plasma, II: 1820, 1992

HESPERIDIN
effects on blood cells, IV: 5103

HETEROPHORIA (see also Diplopia), I: 136, 137, 140; IV: 3818, 4068, 4700

effects of:

altitude, I: 640

drugs, IV: 3836

oxygen breathing, IV: 3836

effects on depth perception, IV: 4064, 4315

general physiological factors, II: 1316

incidence, II: 1660

relation to diplopia, III: 2464

test methods, I: 139, 1333; III: 3036

treatment, II: 1660

HIBERNATION (see also Hypothermia)

effects on blood electrolyte content, IV: 4853

reviews, III: 3439; IV: 4575

role of:

adrenal glands, III: 2646

thyroid gland, III: 2646

HIBERNATORS

physiology, III: 2645

temperature regulation, IV: 4400

HIGH ALTITUDE BAILOUT see Bailout, at high altitude

HIGH ALTITUDE FLIGHT (see also Balloon flights; Space flight), III: 3090

effects on:

instrument panel visibility, III: 2680

spleen, III: 2611, 2670, 3228

visual perception, II: 1188, 1189; IV: 4582

flight feeding, IV: 4366

liquid diets, IV: 4366

medical problems, I: 118, 120, 138, 173, 202, 203, 221, 245, 281, 297, 357, 438, 446, 586, 632, 724, 770, 792, 813; II: 938, 955, 972, 1072, 1073, 1198, 1199, 1230, 1308, 1373, 1514, 2022, 2126, 2160; III: 2443, 2864, 2865, 3017, 3181, 3267, 3459, 3513; IV: 3753, 3923, 4149, 4508, 4513, 4585, 5032

research methods, III: 3234

retinal adaptation, I: 245

safety, II: 927, 1627

spatial orientation, I: 220

training methods, II: 2270

visual problems, III: 3311

HIGH SPEED BAILOUT see Bailout, at high speed

HIGH SPEED FLIGHT (see also Supersonic flight)

effects on:

cabin temperature, III: 2960

cardiovascular system, III: 3521

visual perception, II: 1188, 1189; III: 2795

medical problems, II: 972, 1072, 1073, 1230, 1308, 1373, 1514, 1997, 2136, 2279; III: 2865, 3229; IV: 4513, 4585, 5032

visual problems, III: 3311; IV: 4926

HIGH TEMPERATURE see Heat; Hyperthermia

HIGHER NERVOUS ACTIVITY see Brain activity

HIPPURIC ACID METABOLISM

effects of mental stress, II: 1925

relation to anxiety proneness, II: 1053

HISTAMINE AND DERIVATIVES

effects on:

anoxia tolerance, III: 2775; IV: 3762

hyperoxia tolerance, IV: 4281

HISTORY see under Aviation medicine; Space medicine; Supersonic flight. Also see items under Medical histories

HONDURAS see under Air evacuation

HORMONES (see also Adrenocorticotropic hormone; Androsterone; Intermedin; Progesterone; Somatropin; Thyrotropin; Vasopressin)

effects on:

ascorbic acid metabolism, IV: 4664

HOSPITAL FACILITIES see under Airports

HOSPITAL PLANES see Ambulance planes

HOSPITALS (see also Airports, hospital facilities; Emergency hospitals; Operating rooms), II: 956

HOT CLIMATES

cause of:

dehydration, IV: 4525

fatigue, III: 2708

general psychological effects, III: 2707

lack of adaptation, IV: 4526

nutritional requirements, III: 2914, 2923, 2991, 3208, 3210, 3328; IV: 4804, 4828

research methods, III: 3358

water exchange, III: 3000; IV: 4525

HUMAN CENTRIFUGES, I: 22, 39, 46, 63, 65, 170, 701; IV: 3939, 4233, 4505, 4604, 4605, 4609, 4694

equipment, III: 2540

HUMAN ECOLOGY IN SPACE see Survival, in space

HUMAN ENGINEERING (see also under Aircraft; Aircraft controls; Airplanes; Airports; Cabins; Cockpits; Communication systems; Control knobs; Control levers; Controls; Electronic equipment; Flight simulators; Gunnery controls; Instrument dials; Instrument panels; Jet engine controls; Landing strips; Navigational equipment; Pedals; Pressure cabins; Radar equipment; Rockets; Sealed cabins; Seats; Space stations; Switches; Target tracking, training devices; Traffic control systems; Training devices; Warning devices (Optical); Windshields. See also Engineering factors under Accidents; see also Psychomotor performance, analysis) II: 2226; III: 2955

handbooks and treatises, IV: 5184

relation to body measurements, III: 3144; IV: 4670

research, III: 3281

reviews, I: 845
role in aircraft industry, III: 2870, 2949
HUMAN ISOLATION (see also Restraint)
general physiological effects, III: 2478
general psychological effects, III: 2503
HUMIDITY (see also under Cabins)
effects on:
body temperature, IV: 3912
chloride metabolism, III: 2911
perspiration, II: 1564; IV: 4447, 4455
skin, I: 365
sweat composition, III: 2911
general physiological effects, IV: 3914
measurement, IV: 4786
HYDERGINE
effects on cold tolerance, I: 509
HYDRAULIC FLUID (see also Tricresylphosphate)
toxic effects, III: 2499
HYDRAZINE
toxic effects, I: 61; II: 1254, 1684, 1774; III: 2606
HYDROGEN ION CONCENTRATION see entries under pH
HYDROGEN PEROXIDE
toxic effects, II: 1971
HYGIENE AND SANITATION see subdivision Sanitary aspects
HYOSCINE see Scopolamine
HYPERCAPNIA (see also Acidosis)
animal experiments, III: 2447
effects on:
adrenal glands, III: 3003, 3004, 3428
blood, II: 990
blood cells, III: 3003, 3428
carbohydrate metabolism, III: 3428
cerebral circulation, III: 3292
heart function, III: 3526
hypophysis, III: 3004
interoceptors, II: 964
kidney function, II: 1326
mental performance, III: 2486, 2487
respiration, I: 166, 456; II: 1839; III: 2692
retinal circulation, II: 1693
standing potential, I: 217
voluntary apnea, II: 1100
general physiological effects, II: 1259
warning devices, I: 217
HYPERGLYCEMIA see Blood sugar
HYPEROXIA (see also Oxygen breathing)
effects on:
adrenal glands, II: 1054; IV: 4214, 4216
ascorbic acid metabolism, IV: 4214
autonomic nervous system, II: 2057
blood, I: 664; II: 990, 1045, 1739
blood carbon dioxide tension, II: 1695
blood oxygen tension, II: 1695
brain activity, III: 2455; IV: 5183
brain metabolism, II: 1695
carbohydrate metabolism, III: 3301
carbon dioxide tension of tissues, II: 1698
cerebral circulation, II: 1695; IV: 4645
circulation, II: 1456, 2250; III: 3530
depth perception, IV: 3929
electrocardiogram, I: 607, 884; III: 3530
electroencephalogram, III: 2454, 3170; IV: 4144
endogenous formation of carbon monoxide, II: 1784
heart function, IV: 3750
lung, I: 126, 127; II: 1054; III: 2418, 2832, 2845; IV: 4282
mental performance, I: 164, 167
metabolism, IV: 3789
pulmonary circulation, II: 1045, 2145
respiration, II: 1696, 1697, 1739; III: 2418, 3530
retinal circulation, II: 1693
visual perception, II: 1088, 1393, 1941
voluntary apnea, II: 1100
general physiological effects, I: 15, 125, 126, 127; II: 2250; III: 2828; IV: 4618
role of:
adrenal glands, III: 2799
endocrine system, IV: 4972
tolerance see Hyperoxia tolerance
HYPEROXIA TOLERANCE, III: 2798
effects of:
drugs, IV: 4215
antihistaminics, IV: 4281
chlorpromazine, III: 2832, 2845; IV: 4282
histamine, IV: 4281
tetraethyl ammonium, IV: 4282
vitamin E, II: 2164; IV: 5046
X-rays, III: 2797
role of:
adrenal glands, IV: 4215, 4971
autonomic nervous system, III: 2845
enzyme activity, III: 2800

hypophysis, I: 125, 126, 127; II: 1054

HYPERPNEA see Hyperventilation

HYPERTHERMIA (see also Fever; Pyrogenic agents)

effects of:

anoxia, IV: 4485

effects on:

autonomic nervous system, IV: 4207

heat tolerance, III: 3676

reviews, IV: 4819

HYPERVENTILATION (see also Hypocapnia)

cause of apnea, III: 2653, 2872, 2873; IV: 4071

caused by:

anoxia, I: 166, 451

pressure breathing, II: 1521; IV: 5111

effects on:

blood oxygen tension, II: 1521

blood pH, III: 3137

blood sugar, II: 2282

electroencephalogram, II: 1168, 2282; III: 3316, 3431; IV: 5189

electrolyte distribution, IV: 4736

flicker fusion frequency, II: 1615

kidney function, II: 2205

nitrogen elimination, I: 179

psychomotor performance, IV: 4540

urine pH, III: 3137

vital capacity, III: 3527

voluntary apnea, II: 1100

water exchange, IV: 4016

general physiological effects, II: 1155; IV: 4392

relation to accidents, IV: 4392

HYPNOTICS (see also specific hypnotics, e.g., Morphine)

effects on altitude tolerance, IV: 4436

HYPOCAPNIA (see also Alkalosis; Hyperventilation)

caused by altitude, I: 898

effects on:

anoxia tolerance, III: 3051

circulation, III: 2557

cold tolerance, III: 3051

electrencephalogram, II: 1591

heart function, II: 1717

intracranial pressure, II: 1476

HYPOGLYCEMIA see Blood sugar

HYPOPHYSIS (see also Adrenocorticotropic hormone; Intermedin; Somatropin; Thyrotropin; Vasopressin)

effects of:

anoxia, IV: 5041

cold, III: 2995; IV: 5007

heat, IV: 5041

hypercapnia, III: 3004

role in:

anoxia, I: 614; II: 2207

fatigue, II: 1797

hyperoxia tolerance, I: 125, 126, 127; II: 1054

lipid metabolism, III: 3049

HYPOTHERMIA (see also Hibernation), III: 2693

aftereffects, IV: 3733, 4136

animal experiments, III: 3496; IV: 3906

effects on:

adrenal glands, IV: 4102, 4103, 4198

anoxia tolerance, III: 2850

antibodies, IV: 3797

autonomic nervous system, IV: 4207

blood, III: 2626, 2982; IV: 5003

blood cells, IV: 4334

blood pH, III: 3273; IV: 4002

blood pressure, III: 2881

blood volume, III: 2637

cerebral circulation, III: 3393; IV: 4469

circulation, III: 2983; IV: 4304, 4891, 5113

coronary circulation, III: 2974

electrocardiogram, IV: 4003, 4004, 4599

electroencephalogram, III: 2556, 2730; IV: 4144, 4145, 4932

electrolyte distribution, IV: 4736

heart function, III: 2475, 2982; IV: 4005, 4329, 4709

kidney function, III: 2471; IV: 4650, 4673, 5113

liver function, IV: 4304

metabolism

oxygen consumption, III: 2965; IV: 4891

metabolism of organs

brain, III: 3393; IV: 4469

heart, III: 3525; IV: 4002

metabolism of substances

sulfhydryls, III: 2452, 3361

pulse rate, III: 2591

reflexes, III: 2556; IV: 5038, 5039

renal circulation, IV: 4650

respiration, III: 3273

temperature regulation, III: 2897; IV: 4448

X-ray tolerance, I: 535, 537; II: 2141

general physiological effects, IV: 3787, 3940, 4054, 4815, 4918

induced by drugs, III: 2983; IV: 3906

pathological effects, IV: 4684, 4918

psychological factors, III: 2450, 2451

resuscitation, IV: 4815

reviews, IV: 4819

HYPOTHERMIA TOLERANCE

relation to age, IV: 4599

HYPOXEMIA, HYPOXIA see Anoxia

IDENTIFICATION see Target identification; Voice identification. Also see under Aviation casualties; Personnel

IDIOPHONIC EFFECT see under Auditory stimuli

ILLUMINATION (see also Cockpits; Instrument panels

effects on:

activity rhythm, III: 2403; IV: 3746, 4169

biological rhythms, III: 2961

brightness discrimination, IV: 3835, 4330, 4522

color vision, II: 1146, 1605, 1817, 1974, 2062; III: 3356; IV: 4470

contour perception, II: 1218

dark adaptation, I: 200, 601; II: 1855; III: 3650

depth perception, II: 1353, 2009, 2014; III: 3232, 3409

form perception, II: 1218; III: 3031

motion perception, II: 2014; III: 3075; IV: 4521

psychomotor performance, II: 1732, 1770; IV: 3795

size perception, II: 2009

spatial orientation, I: 424, 425

visual acuity, I: 514; II: 2298; IV: 3825, 4069

visual illusions, II: 2014

visual perception, I: 201, 276, 760; II: 2014; IV: 4998

relation to night myopia, IV: 3955, 4403, 4405

ILLUMINATION (FLICKER) see Intermittent light

ILLUSIONS see Sensory illusions

IMAGE DISPARITY see Binocular vision, effects of image disparity

IMMUNITY see under Infectious diseases. Also see Antibodies

IMMUNIZATION (see also Communicable diseases, control), I: 772, 773; II: 1357

IMPACT

analysis, II: 2033

cause of:

head injuries, IV: 4290

lung injuries, IV: 5012

effects on:

brain, IV: 4287

intracranial pressure, III: 2856

general physiological effects, II: 2033, 2276; IV: 4141, 4290

pathological effects see Crash injuries

IMPACT TOLERANCE, II: 1388, 2132; IV: 4999, 5000

INDIA see under Aviation medicine; Personnel, selection; Pilots, selection

INDOCHINA see under Aviation medicine

INDUSTRY see Aircraft industry

INFECTIOUS DISEASES (see also Communicable diseases; Food poisoning

immunity

effects of:

altitude, II: 1538, 2106; III: 2476; IV: 4352, 5107

altitude acclimatization, I: 148, 149, 150; IV: 3830, 3831

heat, IV: 4302

IN FLIGHT FEEDING see Flight feeding

INFLUENZA A VIRUS, I: 148; IV: 3831

INFORMATION see Advance information; Misinformation; Transfer of information

INFORMATION FEEDBACK

effects on:

psychomotor performance, IV: 4270, 4757, 4919

INHABITANTS OF MOUNTAINS, IV: 3723, 3777, 4388, 4389, 4544, 4614, 4663, 4881, 5130

body measurements, I: 861, 862; IV: 4880

INJURIES (see also Blast injuries; Bone injuries; Burns; Crash injuries; Hand i.; Head i.; Leg i.; Lung i.; Neck i.; Parachuting i.; Shoulder i.; Spine i.; Tissue trauma)

caused by bailout at high speed, IV: 3999

statistics, IV: 4089

INNER EAR see Labyrinth

INSECTICIDES see Tetraethyl pyrophosphate

INSECTS

altitude tolerance, IV: 4743

cold tolerance, IV: 4743

effects of:

altitude, II: 1907; IV: 4744

cold, II: 1907; IV: 4745

on aircraft, I: 553; II: 1357, 1907; IV: 4743, 4744, 4745

control, II: 921; III: 2511, 3317

INSOMNIA see Sleep deprivation

INSTRUCTORS (see also Training officers)

duties, III: 2719, 3327; IV: 5139

morale, I: 737; II: 1581, 1851; IV: 4503

performance, I: 550, 585

tests, III: 3615

personality, I: 493; II: 1019; III: 2942

rating, I: 460, 659; II: 1081; III: 3613

selection, IV: 4530

INSTRUCTORS (FEMALE)

performance, II: 1850

INSTRUMENT CONTROL SYSTEMS, IV: 4431

INSTRUMENT DIALS (see also Scale reading)

human engineering, I: 240, 259; II: 1026, 1213, 1214, 1862, 1863, 2021, 2031, 2071, 2139, 2245; III: 2331, 2336, 2426, 2522, 2523, 2620, 2731, 2777, 2997, 3255, 3605, 3634; IV: 3964, 3967, 3992, 4053, 4088, 4160, 4563, 4876, 4938, 4939, 4940

INSTRUMENT FLIGHT (see also Electronic equipment, use in piloting), I: 36, 599, 707, 794; II: 1410, 1763; IV: 5075

galvanic skin response, IV: 4391

general physiological effects, IV: 4789

general psychological effects, IV: 4789

learning, IV: 4855

medical problems, IV: 3891

spatial orientation, I: 36

training devices, III: 3562, 3653

training methods, IV: 4009

INSTRUMENT GUIDANCE SYSTEMS, III: 2614, 3489; IV: 4629

INSTRUMENT LANDINGS, I: 646, 647, 648; IV: 4872

INSTRUMENT PANELS (see also Instrument dials)

color, II: 2213; III: 3040; IV: 4968

human engineering, I: 36, 79, 130, 277, 280, 342, 646, 648, 760, 776, 780; II: 1156, 1166, 1395, 1953, 1955, 2070, 2081, 2185; III: 2317, 2327, 2426, 2603, 2635, 2739, 2950, 2997, 3249, 3262, 3388; IV: 3879, 3896, 4155, 4275, 4371, 4372, 4374, 4459, 4726, 5005, 5095

illumination, I: 200, 794, 886; II: 2127, 2128; III: 3141, 3650; IV: 4014

visibility

effects of high altitude flight, III: 2680

INSTRUMENTAL MAGNIFICATION

effects on:

form perception, III: 3206

visual acuity, III: 3007

INTELLECTUAL ABILITY see Mental ability

INTELLIGIBILITY see under Auditory signals; Messages; Radar signals; Speech; Visual signals; Written tests. Also see subdivisions Interpretation; Legibility; Recognition

INTERCOM SYSTEMS, II: 1662

INTEREST see Reading interest; Vocational interest

INTERMEDIN

effects on:

biological rhythms, III: 2804

dark adaptation, IV: 4641

INTERMITTENT LIGHT (see also Signal lights (Flashing))

cause of epilepsy, III: 2328

effects on:

psychomotor performance, IV: 3795, 4445, 4446

spatial orientation, III: 2415

visual perception, II: 1443; III: 3454

time factors, II: 2791, 2792

INTERNATIONAL MILITARY AERONAUTICAL PENTATHLON see Sport activities

INTEROCEPTORS

effects of:

anoxia, II: 965

hypercapnia, II: 964

INTERPLANETARY SPACE see Space environment

INTERPRETATION see under Visual displays; Visual signals. Also see subdivisions Intelligibility; Legibility; Recognition

INTERVIEWS see Psychological interviews

INTESTINAL DISEASES (see also Peptic ulcer), III: 3607

incidence in aviators, IV: 3720

INTRACRANIAL PRESSURE

effects of:

anoxia, I: 405; II: 1476

explosive decompression, II: 2247

hypocapnia, II: 1476

impact, III: 2856

INTRAPULMONARY PRESSURE (see also Pressure breathing; Valsalva maneuver)

effects of explosive decompression, IV: 4571

effects on:

blood pressure, II: 1106

cardiovascular system, III: 2999

respiration, II: 1013

INVENTORY see Biographical inventory

IODINE METABOLISM

effects of heat acclimatization, IV: 3986

IONIZING RADIATIONS (see also Cosmic rays; Nuclear radiations; X-rays)

biological effects, I: 546, 547; III: 3505

effects on:

enzyme activity, I: 338

eye, II: 1638

IRON CONTENT see under Blood plasma
IRON METABOLISM
effects of:
altitude acclimatization, II: 2223
anoxia, IV: 4903
relation to:
altitude tolerance, III: 2629
diurnal cycle, IV: 3868
ISCHEMIA
effects on:
brain activity, II: 1328
brain metabolism, III: 3549
ISOLATION see Human isolation
ISOPHENERGAN
use in motion sickness, I: 236
ISOTOPES see Radioisotopes
ITALY see under Aviation medicine
JAW MOVEMENTS
effects on auditory perception, II: 1420
in speaking, I: 459
JET ENGINE CONTROLS
human engineering, III: 3042
JET ENGINE NOISE
analysis, I: 378; II: 1599, 1705, 1962, 2216; III: 2590, 3253; IV: 4262
effects on:
cochlea, II: 973
hearing, I: 62, 743; II: 1871, 1935, 2049; III: 3420; IV: 4787
general physiological effects, I: 42; II: 1127, 1285
general psychological effects, II: 1823
reduction, I: 62; II: 1285, 1391, 1956, 2217; III: 2590; IV: 3824, 3917, 3969, 4056, 4552, 5091
JET FUELS (see also Kerosene)
toxic effects, I: 80; IV: 4024
JET PLANE FLIGHT (see also High altitude flight; High speed flight)
medical problems, I: 105, 423, 724; III: 3641
JET PLANE FLIGHT SIMULATORS, IV: 3889
JET PLANE NOISE
analysis, II: 2177; III: 3244, 3253; IV: 3860
effects on hearing, I: 28; II: 1301, 1721, 1871, 1935; III: 2309; IV: 4785, 4787
pathological effects, III: 2309
reduction, II: 1721; IV: 4262, 4785
tolerance, IV: 4108
JET PLANE NOISE (INTERIOR)
cause of auditory fatigue, III: 2665
reduction, III: 2665; IV: 4262
JET PLANE PILOTING
cause of anxiety, IV: 3799
effects on:
ballistocardiogram, IV: 4642
cardiovascular system, III: 3398
fatigue, I: 628; II: 1075, 2262; IV: 5129
general psychological effects, I: 21; II: 1598
mental stress, II: 1598
training devices, IV: 5079
JET PLANE PILOTS
training, IV: 3799, 4707
JET TRAINERS see Jet plane flight simulators
JOB ANALYSIS, I: 746; II: 2228; III: 2969; IV: 5019
bibliography, II: 1640
JOYSTICKS see Aircraft controls
JUDGMENT see Reasoning
KEROSENE
toxic effects, I: 629; III: 2655, 3586
KETONE METABOLISM
effects of:
anoxia, II: 1681
cold, III: 3417
physical work, III: 3417
KETOSTEROIDS see Steroids
KIDNEY (see also Renal circulation; Urine)
effects of:
altitude, II: 1169
cold, II: 1842
mental stress, IV: 4408
metabolism
effects of cold, II: 1842
pathology, II: 2153
research methods, III: 2715
KIDNEY FUNCTION (see also Excretory rhythm)
effects of:
altitude, I: 625; II: 1392
altitude acclimatization, II: 974
anoxia, I: 108, 109, 771; II: 974, 1392, 2076, 2205; IV: 3697, 4031, 4032
apnea, IV: 4173
cold, IV: 4724
hypercapnia, II: 1326
hyperventilation, II: 2205
hypothermia, III: 2471; IV: 4650, 4673, 5113

negative pressure breathing, II: 2095; III: 2783, 3469; IV: 5036

Salyrgan, I: 108

KINESTHESIA see Proprioception

KITCHEN FACILITIES see under Airplanes

KITS see Medical kits

KNEE JERK REFLEX see Patellar reflex

KNOBS see Control knobs

KOREAN CAMPAIGN see under Air transportation of patients; Flight surgeons, duties; Military medicine

LABORATORY FACILITIES see under Physical examination

LABYRINTH (see also Cochlea; Equilibrium)

action potentials see Labyrinth, electrical potentials

effects of:

acceleration, I: 408; II: 1474, 1550; III: 2852, 2975, 3057, 3412; IV: 4501

airplane flight, II: 1439; III: 2401

caloric stimuli, III: 3059

drugs

acetylsalicylic acid, II: 2859

codeine, II: 2859

diisopropyl fluorophosphate, III: 3373

meperidine, II: 2859

methadone, II: 2859

morphine, II: 2859

motion sickness drugs, III: 3062

opium, II: 2859

electrical stimuli, II: 1010, 1665

noise, II: 952

rotation, I: 99, 253, 407, 616, 620; II: 996, 1447, 1500, 1501, 1502, 1528, 1529, 1550, 1666, 1819, 1877, 1878, 1898, 2299; III: 3058, 3060, 3433, 3445, 3446

test methods, III: 3434; IV: 4666

subgravity, I: 475; II: 931; III: 2319; IV: 4964

electrical potentials

effects of rotation, III: 2698; IV: 4666

examination, III: 3059, 3061

function tests, IV: 4497, 4702

physiology, II: 1497, 1529, 1818; III: 2701

relation to:

equilibrium, II: 1665, 1876; III: 3339

muscular function, II: 1490

neuromuscular reactions, II: 1447

role in spatial orientation, I: 410, 411, 556, 903; II: 1079, 1482, 2166; IV: 3827, 5185

stimulation see Vestibular stimulation

LACK OF ADAPTATION see under Hot climates

LACTIC ACID METABOLISM

effects of:

altitude acclimatization, IV: 3830

anoxia, III: 3577; IV: 5104

LANDING see Aircraft landings; Instrument landings

LANDING STRIPS

human engineering, IV: 4363

LAUNCHING see Balloon launching

LEADERSHIP, I: 653; II: 1231, 1530, 1531, 1587, 1589, 1632, 1846; III: 2941, 2944, 2945, 2946, 3329, 3421, 3614, 3688; IV: 4368, 4986

bibliography, II: 2039

effects on:

team morale, IV: 4943

team performance, IV: 4943

relation to physical fitness, III: 2964

test methods, III: 2500, 2876, 3250; IV: 3828, 4305, 4735

LEARNING (see also Practice; Training), I: 160, 711, 712, 713, 714; II: 946, 947, 983, 1024, 1095, 1397, 1494, 1667, 1723, 1726, 1727, 1764, 1999, 2098, 2109, 2113, 2186; III: 2498, 2772, 2869, 3089, 3222, 3365; IV: 4292

analysis, III: 3382; IV: 4250

effects of:

anxiety, II: 1292, 2163; III: 3159; IV: 4661

misinformation, IV: 4671

motivation, II: 2024

in instrument flight, IV: 4855

in visual flight, IV: 4855

psychological factors, IV: 4597

tests, IV: 4713

LEFTHANDEDNESS see Handedness

LEG INJURIES, I: 261

caused by parachute jumping, III: 3276

LEGAL ASPECTS see under Air transportation of patients

LEGIBILITY see under Charts; Letters; Numerals. Also see subdivisions Intelligibility; Interpretation; Recognition. Also see Scale reading

LENSES see Contact lenses

LERGIGAN

use in motion sickness, I: 230, 231, 233, 234, 236, 768; II: 1225

LETTERS (see also Printed words)

legibility, I: 276, 581, 582; II: 1005, 1156, 1778; III: 2630, 3114; IV: 4562

LEUKOCYTES see Blood cells

LEVERS see Control levers
LICORICE see Glycyrrhizin
LIFE CONDITIONS see under Mars; Planets; Venus
LIFE EXPECTANCY see under Aviators
LIFE RAFTS, II: 1366
color, I: 34, 144; II: 1785
LIFE SUSPENSION
caused by cold, III: 2462
LIGHT ADAPTATION see Retinal adaptation
LIGHT FILTERS see Optical filters
LIGHT SIGNALS see Signal lights
LIGHT STIMULI (see also Visual stimuli)
effects on:
auditory perception, II: 1489; IV: 4884
brightness discrimination, II: 1051, 1300
color adaptation, II: 1683
dark adaptation, I: 864; II: 1387, 1427, 1779, 1825, 1854
electroencephalogram, I: 853, 906; II: 1168, 2112, 2202, 2203, 2204; III: 2855, 3572, 3573
electroretinogram, II: 1796, 2112
eye movements, II: 1444
oxygen consumption, III: 2961, 3154
reaction time, II: 2002
retinal adaptation, I: 198, 294, 480, 864; II: 1135, 1426
spatial orientation, I: 424
velocity discrimination, III: 2548
LIGHTING see Illumination
LIGHTS see Signal lights
LINK TRAINERS see Flight simulators
LIPASE see Lipase content under Blood
LIPEMIA see Blood, lipid content
LIPID METABOLISM
effects of:
anoxia, III: 3049
cold, III: 2888; IV: 3813, 5080, 5081
cold acclimatization, III: 3280, 3452
environmental temperature, IV: 4728, 5196
physical work, IV: 3813
starvation, IV: 3812
stress, IV: 3813
tissue trauma, II: 1992, 1993; III: 3201, 3202, 3203, 3359
relation to:
cardiovascular diseases, II: 1820; III: 3203
oxygen consumption, IV: 4728
role of:
adrenal glands, IV: 4728
hypophysis, III: 3049
LIPIDS see Lipid metabolism; Steroids. Also see Lipid content under Blood
LIPOIDS see entries under Lipids
LIPOPROTEINS see Lipid metabolism
LIQUID DIETS
in high altitude flight, IV: 4366
LISERGAN
use in motion sickness, I: 142, 336
LISTENING PERFORMANCE (see also Speech, intelligibility)
effects of noise, IV: 4775
physical factors, IV: 4997
relation to psychomotor performance, IV: 4076
LITTERS see Stretchers
LIVER
effects of:
altitude, III: 3437
altitude acclimatization, I: 237
anoxia, III: 2936
mental stress, IV: 4691
examination, III: 3396
metabolism
effects of:
altitude, I: 362
anoxia, IV: 3794, 4489
ascorbic acid, III: 2658
carbon dioxide, IV: 4457
cold, III: 2658, 3452; IV: 4617, 5145
diet, IV: 4809
starvation, IV: 4617
role in potassium metabolism, IV: 4601
LIVER FUNCTION
effects of hypothermia, IV: 4304
LOCALIZATION see under Sound; Visual stimuli
LOUDNESS see Speech, loudness
LOUDNESS DISCRIMINATION, I: 709, 710; II: 2167; IV: 4811, 4816
effects of noise, II: 1203
measurement, IV: 5009, 5069
test methods, I: 191; III: 3333; IV: 5008
tests, IV: 3848
thresholds, IV: 5069
LOW ALTITUDE see Bailout at low altitude

LOW PRESSURE see Altitude

LOW PRESSURE CHAMBERS see Decompression chambers

LOW TEMPERATURE see Cold; Hypothermia

LUBRICANTS (see also Engine oils)
hazards, IV: 3707
toxic effects, III: 3564

LUNAR CYCLE
relation to biological rhythms, IV: 3895

LUNAR EXPEDITIONS, III: 3451, 3600

LUNG (see also Alveolar carbon dioxide tension; Alveolar oxygen tension; Intrapulmonary pressure; Pulmonary circulation; Respiration)
effects of:
altitude, II: 1169
anoxia, I: 404, 470; II: 1264, 1432; III: 2622
blast, I: 225, 226; III: 2576, 2597
explosive decompression, I: 418, 623, 855, 856, 868; II: 1432, 1477, 1656, 2208, 2249; III: 2597, 2891, 3340, 3592; IV: 4319
hyperoxia, I: 126, 127; II: 1054; III: 2418, 2832, 2845; IV: 4282
negative acceleration, IV: 3809
oxygen breathing, IV: 4283
pressure breathing, II: 1656; III: 3340
function tests, I: 181, 820; III: 3171, 3172, 3418; IV: 3816, 4907
metabolism, IV: 3867
pathology see Pneumothorax, II: 1322
effects on air transportability, I: 303
physical properties, II: 1808
temperature
effects of explosive decompression, II: 2210

LUNG INJURIES
caused by impact, IV: 5012

LYMPH FLOW
effects of anoxia, II: 3028

MAGNIFICATION see Instrumental magnification

MAINTENANCE PERSONNEL
classification, II: 1271
occupational deafness, II: 2233; III: 3078; IV: 3707, 4480
occupational diseases
prevention, IV: 4090
occupational hazards, III: 3266, 3284, 3408
performance, I: 151, 485; II: 959, 2100, 2228, 2272
test methods, II: 2094; III: 2969, 3473
tests, II: 1636
rating, I: 412, 486; II: 1636
selection, I: 485, 486; II: 1271
training, II: 961, 963; III: 2350, 2351, 2354; IV: 3703, 4956

MALARIA, III: 3607
effects of altitude acclimatization, IV: 5143
incidence in aviators, IV: 3720

MANEUVER see Valsalva maneuver

MANHIGH PROJECT see Balloon flights

MANIPULATION TESTS see Neuromuscular performance, tests

MAN-MACHINE SYSTEMS (see also Psychomotor performance, analysis), III: 2325, 2803, 3034; IV: 3709, 3740, 3843, 3882, 4018, 4120, 4232, 4235, 4703, 4766

MAN-MADE SATELLITES (see also Space stations), III: 3087

MANNED SATELLITE FLIGHT see Space flight

MANUALS see items under Handbooks and treatises

MAREZINE see Cyclizine

MARROW see Bone marrow

MARS (PLANET)
atmosphere, III: 2677, 3120, 3457; IV: 4244
life conditions, I: 810; II: 2146, 2147, 2148; III: 3512

MASKS (see also Oxygen masks)
evaluation, II: 1754

MEALS see Food intake

MEASUREMENTS see Body measurements. Also see Measurement under items measured; e.g., Acceleration, measurement; Cerebral circulation, measurement

MECHANICS (Personnel) see Maintenance personnel

MECLIZINE AND DERIVATIVES
use in motion sickness, IV: 4460, 5023

MEDICAL ATTENDANTS
duties, III: 2419
training, I: 302, 807; IV: 4052

MEDICAL CARE see under Personnel. Also see Dental care; Neuropsychiatric care

MEDICAL EXAMINATION see Neuropsychiatric examination; Physical examination

MEDICAL HISTORIES see under Aviators

MEDICAL KITS, II: 1748
use in parachute jumping, III: 2394

MEDICAL PERSONNEL (see also Flight nurses; Flight surgeons; Medical attendants; Pharmacists; Psychiatrists; Rescue medical teams)
air transportation, I: 57; IV: 5192
duties, II: 956, 998, 1852; III: 3243
France, I: 157

orientation and guidance, III: 3140

training, II: 1896, 1899; III: 3140

MEDICAL SUPPLIES see Aeroplast; Medical kits

MEDICAL TEAMS see Rescue medical teams

MEDICINE see Aviation medicine; Military medicine; Psychosomatic medicine; Space medicine

MEETINGS see under Congresses, meetings, and symposia

MEMORY (see also Retention under Messages)

effects of:

anoxia, III: 2506; IV: 5068

explosive decompression, III: 3135

oxygen breathing, III: 3337

starvation, II: 1663

role in pattern discrimination, IV: 3756

tests, IV: 3883

MENIÈRE'S SYNDROME see Labyrinth, pathology

MENISCOCYTOSIS see Sicklemia

MENSTRUATION

effects on:

equilibrium, II: 2038

spatial orientation, II: 2038

MENTAL ABILITY (see also Memory)

relation to:

anxiety, IV: 4453

training, III: 3548

visual accommodation, I: 258

tests, I: 849, 907; III: 2970

MENTAL DISEASES

effects on air transportability, I: 808; III: 2419, 3509; IV: 3854

MENTAL FATIGUE, II: 1024

reviews, II: 1646

MENTAL PERFORMANCE (see also Decision making performance; Reasoning)

effects of:

advance information, II: 1809, 1810

anoxia, I: 164, 167; III: 2486, 2487; IV: 4688, 5024

anxiety, II: 1647; III: 3159

drugs

Benadryl, I: 689; II: 1917

dimenhydrinate, I: 689; II: 1917

glycyrrhizin, IV: 4309

motion sickness drugs, IV: 4761

scopolamine, I: 689; II: 1917; IV: 3716

fatigue, IV: 4416

heat, II: 1047

hypercapnia, III: 2486, 2487

hyperoxia, I: 164, 167

mental stress, II: 1647, 1710; III: 3504

noise, II: 1809, 1810; III: 2971; IV: 3736, 4416, 4874

sleep deprivation, IV: 3953, 3954

subgravity, III: 2601

fatigue, II: 1646

psychological factors, II: 1809, 1810

relation to:

diurnal cycle, IV: 3846

personality, IV: 3736

test methods, IV: 4839

transfer of training, II: 1723

MENTAL STRESS (see also Anxiety)

effects on:

adrenal glands, III: 2770

blood, II: 1925

blood cells, II: 1320

circulation, II: 1776

flicker fusion frequency, III: 2558

gastric secretion, III: 3153

hippuric acid metabolism, II: 1925

kidney, IV: 4408

liver, IV: 4691

mental performance, II: 1647, 1710; III: 3504

psychomotor performance, I: 884; III: 2642, 3472, 3663

reasoning, II: 1761

testis, IV: 4407

general physiological effects, IV: 5011

in jet plane piloting, II: 1598

MENTAL WORK

effects on:

brain metabolism, IV: 4989

cerebral circulation, IV: 4989

circulation, III: 3290

respiration, III: 3290

MEPERIDINE

effects on:

labyrinth, II: 2859

respiration, IV: 5026

MESCALINE

effects on:

brain metabolism, IV: 4093

cerebral circulation, IV: 4093

MESSAGES
intelligibility, II: 1117, 1148, 1149, 1150, 1672; III: 3306, 3553; IV: 3890, 4340, 4341, 4342, 4997, 5066, 5141
tests, IV: 3849
retention, I: 711, 712, 713, 714; IV: 3890
effects of drugs, IV: 4762
psychological factors, IV: 4762
transmission
time factors, IV: 4835
METABOLISM (see also Carbon dioxide production; Enzyme activity; Oxygen consumption. See also metabolism of individual substances: Acetylcholine metabolism; Ascorbic acid m.; Carbohydrate m.; Chloride m.; Citrate m.; Electrolyte distribution; Glutamine metabolism; Hippuric acid m.; Iodine m.; Iron m.; Ketone m.; Lactic acid m.; Lipid m.; Nitrogen m.; Nucleic acid m.; Oxygen m.; Phosphorus m.; Potassium m.; Protein m.; Sodium m.; Steroid m.; Succinic acid m.; Sulfhydryl m.; Water exchange. See also Metabolism under tissues and organs: Adrenal glands; Bone marrow; Brain; Heart; Liver; Lung; Muscular system; Myocardiac tissue; Retina; Salivary glands; Spleen; Tissues)
effects of:
altitude, III: 3080, 3543; IV: 4632
altitude acclimatization, III: 3574; IV: 3976, 4633
anoxia, I: 469, 565; II: 1036
carbon dioxide, III: 2447
chlorpromazine, IV: 5044
cold, I: 469; III: 2619, 2659, 2889, 3278, 3461, 3499; IV: 4027, 4613
race factors, IV: 4635
cold acclimatization, III: 2619; IV: 3778, 3976, 4040, 4482
diet, III: 2560, 3278, 3499
fatigue, IV: 3789
heat, III: 2893
heat acclimatization, IV: 3976
hyperoxia, IV: 3789
physical work, II: 1812; III: 2732, 3152, 3534, 3574, 3587
starvation, III: 3499, 3534
general physiological factors, III: 3152
relation to:
body temperature, IV: 4219
heat tolerance, III: 2732
respiration, IV: 4091
role of adrenal glands, III: 2513
METEORITES, I: 880
METEOROLOGY see Weather
METHADONE
effects on labyrinth, II: 2859
METHENAMINE
effects on:
anoxia tolerance, IV: 3762
METHYL BROMIDE
toxic effects, II: 1634
METRAZOL (Cardiazol)
effects on:
anoxia tolerance, II: 1400
electroencephalogram, II: 1168
MICROORGANISMS (AIRBORNE), III: 3212
distribution, III: 2766
in upper atmosphere, III: 2767, 2768, 3550
MICROPHONES
effects on speaking, III: 3557
MICROWAVE RADIATION
general physiological effects, II: 1152; IV: 3782
hazards, III: 2549; IV: 4928
MIDDLE EAR (see also Tympanic muscles)
effects of:
altitude, I: 48
barometric pressure, II: 2154
explosive decompression, III: 3065
Valsalva maneuver, II: 1702
examination, III: 3063
function tests, IV: 5055
pathology see Aerotitis media
physiology (see also Hearing), II: 2045; IV: 5158
MILITARY MEDICINE (see also Aviation medicine)
bibliography, II: 2020
Korean campaign, II: 2020; III: 2389
United States, II: 1852
MILITARY PSYCHIATRY
bibliography, IV: 4534
MILITARY PSYCHOLOGY (see also Aviation psychology), IV: 4355
MILK
composition
effects of anoxia, II: 1478, 1480; IV: 4253
MIRROR VISION PERFORMANCE, II: 1548
MISINFORMATION
effects on learning, IV: 4671
MOISTURE see Humidity
MONAURAL HEARING
effects on auditory perception, III: 2482; IV: 3838

MONOCULAR VISION
role in:
depth perception, I: 301, 740; II: 1068, 1211, 1233, 1451, 2115; III: 2979, 3538; IV: 5047
size perception, II: 1211, 2115; IV: 4870
MOON see Lunar cycle; Lunar expeditions
MORALE see under Aviators; Instructors; Patients; Teams
MORPHINE AND DERIVATIVES
effects on:
anoxia tolerance, III: 3529
labyrinth, II: 2859
toxic effects, II: 1205; IV: 4696
use in motion sickness, I: 234
MOSIDAL
use in motion sickness, I: 236
MOTION (see also Acceleration)
effects on depth perception, II: 1450, 2222
MOTION ESTIMATION
on visual displays, IV: 3873
physical factors, IV: 4965
MOTION PERCEPTION (see also Dynamic visual acuity; Velocity discrimination), III: 3075
effects of illumination, II: 2014; III: 3075; IV: 4521
physical factors, III: 3074, 3224
relation to dark adaptation, II: 1593
role in aircraft landings, IV: 4224
test methods, II: 1255
tests, IV: 4225, 4240
time factors, IV: 4521
MOTION PERCEPTION (ILLUSORY), III: 2880
relation to dark adaptation, II: 1593
tests, IV: 4984
MOTION PERCEPTION (PASSIVE), IV: 3998
MOTION PICTURES
as training devices, IV: 4836
use in pilot training, IV: 4274, 4742, 4933
MOTION SICKNESS, I: 4, 84, 89, 142, 143, 156, 230, 231, 232, 233, 234, 235, 236, 292, 293, 333, 336, 382, 517, 518, 689, 738, 745, 768, 870; III: 2810; IV: 3924, 4054, 4433, 4715, 5002
caused by negative acceleration, III: 3122
complications, III: 2810; IV: 5077
effects on psychomotor performance, IV: 3718
etiology, II: 1216, 2212; III: 3458, 3603; IV: 3990, 4200, 4317, 4615, 4917, 4927
general physiological factors, IV: 4007, 4510
incidence, I: 458; II: 1534; IV: 3717, 4510
physical factors, IV: 4420
predisposition, I: 517, 555; III: 3338; IV: 3961, 3990, 4917
test methods, II: 1272; III: 3056, 3662; IV: 3717, 4104, 4818
prevention and treatment (see also Motion sickness drugs, evaluation; Vomiting, prevention), I: 4, 84, 89, 142, 333, 336, 382, 745, 768; II: 1004, 1228, 1372, 1509, 1914, 1915, 1916, 2180, 2212, 2219; III: 2441, 2860; IV: 3959, 4317, 4917
relation to:
autonomic nervous system, I: 738
head movements, I: 517, 518; II: 1629; III: 3338; IV: 4422, 4450
neuroses, II: 1216
posture, IV: 4420
research methods, III: 3501
reviews, IV: 3957, 4594
role of nervous system, IV: 5133
use of drugs see items listed under Motion sickness drugs
MOTION SICKNESS DRUGS (see also Amphetamine; Antihistaminics; Antistine; Atropine; Banthine; Barbituric acid derivatives; Benadryl; Bentyl; Buscopan; Chlorpromazine; Cyclizine; Diatrin; Dibenzylene; Dimenhydrinate; Diparcol; Isophenergan; Lergigan; Lisergan; Meclizine; Morphine; Mosidal; Multergan; Parsidol; Postafene; Probanthine; Promethazine; Pyribenzamine; Pyridoxine; Pyrrolazote; Scopodex; Scopolamine; Soventol; Thephorine; Trimeton; Vomex A), IV: 4138, 4715
effects on:
alertness, III: 3062
labyrinth, III: 3062
mental performance, IV: 4761
psychomotor performance, IV: 4761
reaction time, III: 3062
evaluation (see also Motion sickness, prevention and treatment), I: 230, 231, 232, 233, 234, 235, 236; III: 2395, 2582, 2878, 3048, 3576; IV: 3958, 4510, 5023
general psychological effects, I: 689
side effects, III: 2395; IV: 4229
MOTIVATION (see also Vocational interest; see also under the various personnel categories, e.g., Trainees, motivation), II: 1017, 1018, 1588, 1590
effects on:
learning, II: 2024
performance, IV: 4186
psychomotor performance, III: 3295
MOUNTAIN SICKNESS see Altitude sickness
MOUNTAINS see Inhabitants of mountains
MOVEMENTS see Arm movements; Eye movements; Head movements; Jaw movements; Respiratory movements; Shivering. Also see Motion
MOVIES see Motion pictures

MOVING OBJECTS
recognition
effects of training, IV: 3833
visual perception, IV: 4566
MOVING SCALE INDICATORS see Instrument dials
MULTERGAN
use in motion sickness, I: 236
MUNITIONS SPECIALISTS
training, III: 2353
MUSCLE TISSUE
effects of altitude, I: 257
MUSCULAR COORDINATION see Neuromuscular performance
MUSCULAR FATIGUE, I: 854
measurement, I: 492; III: 2939; IV: 3977
MUSCULAR FUNCTION (see also Electromyogram; Muscular fatigue; Neuromuscular performance; Neuromuscular reactions; Psychomotor performance; Shivering)
effects of:
anoxia, I: 492, 854
electrical stimuli, II: 1490
physical work, I: 854
veratrine, II: 1490
relation to:
age, II: 1137
labyrinth, II: 1490
temperature regulation, IV: 4871
role in respiration, II: 1193, 1194
MUSCULAR STRENGTH
effects of:
posture, IV: 4387, 4829
starvation, IV: 3903
MUSCULAR SYSTEM (see also Muscular function; Tympanic muscles)
action potentials see Electromyogram
effects of:
altitude acclimatization, I: 257
anoxia, I: 386, 492; II: 1421
carbon dioxide, I: 758; II: 1421
cold, IV: 4536
physical work, I: 257, 854
X-rays, I: 373
fatigue see Muscular fatigue
metabolism (see also Heart, metabolism; Myoglobin)
effects of:
anoxia, II: 1793, 2097; III: 3577; IV: 5104
positive acceleration, IV: 3910
MUSCULAR TONUS
effects on:
positive acceleration tolerance, IV: 4256
psychomotor performance, III: 2333
measurement, II: 2253
relation to:
circulation, IV: 4494
fainting, IV: 4494
fatigue, II: 2253
MUSCULAR WORK see Physical work
MYOCARDIAC TISSUE
effects of anoxia, I: 565; II: 1718
metabolism, I: 565
MYOGLOBIN
effects of:
altitude acclimatization, I: 257; IV: 4013, 5109
physical work, IV: 4013
MYOPIA see Night myopia
NARCOTICS (see also Cocaine; Morphine)
effects on vomiting center, III: 3038
NASAL PASSAGES
congestion
effects of:
antihistaminics, II: 1438
ephedrine, I: 566
pathology
relation to eye diseases, III: 3378
NASAL STIMULATION
effects on:
electrocardiogram, II: 2285
electroencephalogram, II: 2285
respiration, II: 2285
NAUTAMINE see Dimenhydrinate
NAVIGATION
role of visual perception, III: 2399
training devices, IV: 4178
NAVIGATIONAL EQUIPMENT
human engineering, II: 1953, 1954, 1955; IV: 4941
NAVIGATORS
selection, II: 1745
NECK INJURIES
effects on air transportability, IV: 4220
NEGATIVE ACCELERATION see Acceleration (Negative)
NEGATIVE PRESSURE BREATHING
effects on kidney function, II: 2095; III: 2783, 3469; IV: 5036
NEGROES see Personnel (Negro)
NEOSTIGMINE (Proserine)
effects on color vision, II: 1682
NERVES (see also Auditory nerve; Phrenic nerve)

effects of:

anoxia, III: 3011

ultrasonic vibrations, II: 1807

pathology, II: 2277

physiology, II: 1818

NERVOUS SYSTEM (see also Analysors; Autonomic nervous system; Brain; Central nervous system; Chronaxia; Nerves; Neuromuscular performance; Neuromuscular reactions; Reflexes; Spinal cord)

effects of:

blast, III: 3386

role in motion sickness, IV: 5133

NERVOUS SYSTEM ACTIVITY

effects of:

altitude, IV: 3942, 4509

altitude acclimatization, III: 2823

role in temperature regulation, IV: 3946, 4036

NETHERLANDS see under Aviation medicine

NEUROMUSCULAR PERFORMANCE (see also Psychomotor performance; Reaction time; Rhythmic ability)

analysis, III: 2736

effects of:

alcohol, III: 3136

altitude, II: 1892

anoxia, II: 1009, 1677

anxiety, III: 3394

clothing, IV: 4901

cold, I: 119, 595; II: 1765; III: 3136

drugs, III: 2898

fatigue, III: 3394

physical work, III: 3570

rest, III: 3570

subgravity, I: 116; III: 2601; IV: 4960

vibration, III: 3105

relation to age, II: 1892

tests, I: 162, 736, 831; III: 2736, 2907

NEUROMUSCULAR REACTIONS

caused by physical work, III: 2930

effects of anoxia, III: 2505

relation to:

labyrinth, II: 1447

pilot performance, III: 2930

NEUROPSYCHIATRIC CARE, IV: 4630

NEUROPSYCHIATRIC DISTURBANCES see Anxiety; Neuroses

NEUROPSYCHIATRIC EXAMINATION (see also Mental ability, tests), I: 83, 91, 168, 318, 610, 774, 819; II: 2077, 2078, 2188, 2281; III: 2510, 2578, 2807; IV: 4935

NEUROPSYCHIATRIC FITNESS (see also under Aviators; Pilots)

relation to age, III: 3223

test methods, II: 1042, 1043, 1115, 1621; III: 2445, 2550, 2970, 3026

tests, II: 1625, 1857; III: 2378

NEUROSES (see also Anxiety), I: 177, 819

caused by:

accidents, IV: 4060

combat stress, II: 1729, 2268; III: 3571

pilot training, III: 2638

prevention and treatment, II: 1860, 2268; IV: 4630

psychological factors, III: 2796

relation to:

flight duty, I: 590; II: 1437

motion sickness, II: 1216

stress, II: 1145

stress tolerance, II: 1145

NIACIN see Nicotinic acid

NICOTINE (see also Tobacco)

effects on:

electrocardiogram, III: 2344

visual perception, II: 1393

NICOTINIC ACID

effects on visual perception, I: 192

use in treatment of deafness, II: 1685

NIGHT FLYING, IV: 4380, 4730

handbooks and treatises, IV: 3951

retinal adaptation, I: 243, 247

training methods, IV: 4009

NIGHT MYOPIA, II: 1123, 1195, 1680, 1895

relation to:

illumination, IV: 3955, 4403, 4405

ocular convergence, IV: 4402, 4403, 4405

NIGHT VISION (see also Night myopia), I: 153, 243, 247; II: 1294; III: 3409; IV: 4044, 4641, 4958

bibliography, I: 703

effects of ephedrine, III: 2836

ocular convergence, IV: 3871, 4405

psychological factors, IV: 4411

relation to:

color vision, IV: 4639

form perception, II: 1826

foveal vision, II: 2046

peripheral vision, I: 420; II: 2046

visual accommodation, II: 1680

visual acuity, IV: 4731

test methods, I: 742; II: 1067, 2201, 2298; III: 2966, 2967, 3173, 3296; IV: 4612

tests, II: 1123

training devices, IV: 4044, 4764, 5186

training methods, I: 432; IV: 4712

NIKETHAMIDE (Coramine)

effects on anoxia tolerance, II: 1400

NITRITES (Amyl nitrite)

effects on visual perception, I: 192; II: 1393

NITROGEN

measurement, IV: 5165

NITROGEN BREATHING

effects on:

blood oxygen tension, II: 1930

pulmonary circulation, II: 1930

NITROGEN ELIMINATION, II: 1112, 1758; III: 2913; IV: 5112

effects of:

altitude, II: 1756

carbon dioxide, II: 1522

hyperventilation, I: 179

oxygen breathing, I: 178, 179; II: 1561, 1756, 2036; III: 2433, 3130

physical work, III: 2433

measurement, III: 2429

relation to pulmonary circulation, III: 2430

NITROGEN METABOLISM (see also Protein metabolism)

effects of:

diet, III: 2562

environmental temperature, IV: 5197

NOCICEPTION see Pain

NOISE (see also Acoustical comfort; Aircraft noise; Auditory stimuli; Engine noise; Helicopter noise; Jet plane noise; Side-tone; Visual noise), I: 176, 709; IV: 4800

analysis, IV: 5198

cause of:

ear pain, IV: 4864

fatigue, III: 2971

effects on:

adrenal glands, I: 449; II: 1519; IV: 3739

auditory perception, I: 837, 840; II: 1003, 1110, 1536, 1868, 2178, 2179; IV: 4099, 4538, 4708

blood, I: 449

blood cells, II: 1171, 1172; IV: 3738, 3739

brain, III: 2553

brightness discrimination, I: 193

circulation, II: 1268

cochlea, I: 271, 427, 428, 838, 839, 917; III: 2623, 3482

depth perception, II: 1068

electrical potentials of cochlea, I: 838

electroencephalogram, II: 2225; III: 2553, 2566

electromyogram, II: 2044

endocrine system, II: 1174, 1176

finger tremor, IV: 4551

hearing, I: 350, 383, 428, 542, 641, 743, 917; II: 941, 1171, 1175, 1302, 1304, 1536, 1537, 1592, 1594, 1685, 1704, 1730, 1775, 1871, 2027, 2042, 2068, 2102, 2175; III: 2663, 2972, 3078, 3094, 3161, 3162, 3404, 3405, 3419; IV: 3745, 3861, 3866, 4080, 4140, 4311, 4376, 4708, 4864, 4874

intelligibility of auditory signals, II: 940

listening performance, IV: 4775

loudness discrimination, II: 1203

mental performance, II: 1809, 1810; III: 2971; IV: 3736, 4416, 4874

psychomotor performance, II: 2273; III: 2532, 2534

pulse rate, IV: 4864

spatial orientation, II: 952

speech intelligibility, I: 551, 837; II: 1108, 1573, 1731, 1872, 2027, 2102, 2232, 2273; III: 2482, 2932, 3205, 3270, 3305, 3307, 3555; IV: 3838, 4100, 4483, 4776, 4777, 4797, 4810

tactile perception, II: 1532

time estimation, IV: 4417, 4970

vigilance, III: 2537

visual acuity, IV: 4551

general physiological effects, I: 501, 552, 650; II: 952, 1171, 1175, 1176, 1286, 1532, 1810, 1912, 2102, 2211; III: 3065, 3105, 3563, 3629; IV: 3982, 5114

bibliography, III: 3116; IV: 4396

general psychological efffects, I: 552; II: 1268, 1286, 1519, 1532, 1951, 2027, 2028, 2135; III: 3078; IV: 3745, 4708

measurement, II: 1775, 2241

bibliography, IV: 4396

handbooks and treatises, III: 3309

pathological effects, II: 3563

reduction (see also Ear defenders), I: 176, 501, 650; II: 1317, 1408, 1425, 1700, 1912, 2028, 2174, 2303; III: 3162, 3620, 3629; IV: 4280, 4311, 4322, 4752

bibliography, IV: 4396

reviews, II: 2028
tolerance see Noise tolerance
NOISE TOLERANCE (see also Jet plane noise, tolerance), IV: 4438
test methods, III: 3066
NONCOMMISSIONED OFFICERS
attitudes, III: 2516
rating, I: 653; II: 1846, 1847
NON-PROTEIN SYLFHYDRYL see Carbohydrate metabolism; Lipid metabolism
NORADRENALINE see Epinephrine
NOVAMINE see Dimenhydrinate
NUCLEAR PROPELLED AIRCRAFT
hazards, II: 1936, 1937
NUCLEAR RADIATION TOLERANCE
effects of:
altitude acclimatization, IV: 3775
anoxia, IV: 3776
NUCLEAR RADIATIONS
biological effects, I: 824
hazards, II: 1936; IV: 5169
NUCLEIC ACID METABOLISM
effects of anoxia, II: 1984, 1985
NUMERALS
legibility, I: 79, 760; II: 1778; III: 3064; IV: 4987, 4988
NURSES see Flight nurses
NUTRITION (see also Diet; Flight feeding; Food; Space flight feeding; Starvation; Water deprivation; see also Nutrition under Air crews; Aviators; Pilots)
effects on:
altitude tolerance, IV: 4012
cold tolerance, III: 3277
hemoglobin, IV: 4012
NUTRITIONAL REQUIREMENTS (see also under Airplane flight; Altitude; Cold climates; Hot climates; Pilot candidates)
effects of environmental temperature, IV: 4809
NYSTAGMUS, I: 750; II: 996, 1527, 1528, 1550, 1819; III: 2948, 3059, 3412, 3446
caused by:
rotation, IV: 3864, 4588
vestibular stimulation, IV: 3785
visual stimuli, IV: 3864
effects of:
drugs, III: 3115
anticholinesterase, III: 3241
antihistaminics, III: 3373
Benadryl, IV: 3785
dimenhydrinate, III: 3373
relation to brain activity, II: 1819
OCCLUSION see Carotid occlusion
OCCUPATIONAL DEAFNESS see under Aviators; Maintenance personnel; Personnel; Pilots; Radio operators
OCCUPATIONAL DISEASES see under Aviators; Bombardiers; Maintenance personnel; Personnel; Pilots; Radar operators. Also see items under Occupational deafness
OCCUPATIONAL HAZARDS see under Aviators; Maintenance personnel
OCULAR CONVERGENCE
in empty visual field, IV: 4404
in night vision, IV: 3871, 4405
relation to night myopia, IV: 4402, 4403, 4405
OCULAR DOMINANCE
relation to depth perception, II: 1533, 1821
reviews, I: 380
role in visual perception, III: 3602
OCULAR RHYTHMS
effects of altitude, IV: 5172
OCULOGRAVIC ILLUSION see Visual illusions
OCULOGYRAL ILLUSION see Visual illusions
ODONTALGIA see Dental disturbances
ODORS (see also Deodorants)
removal see Deodorization
OFFICE OF NAVAL RESEARCH (U. S.), III: 3281
OFFICERS (see also Training officers)
attitudes, II: 950, 1028, 1029; III: 2520
personality, III: 3291
rating, II: 1530, 1531, 2194, 2195; III: 2876
selection, I: 347, 594, 847, 848, 849, 850, 911; II: 1414, 1584, 2195, 2197; III: 2940, 3383, 3656; IV: 4729, 5037, 5086, 5087
training, I: 850
prediction of success, IV: 5037, 5086
OILS see Engine oils
OLFACTORY PERCEPTION
effects of fatigue, II: 2254
test methods, II: 2254
OPERATING ROOMS (TRANSPORTABLE), II: 1192; III: 2921; IV: 4504
OPIUM AND DERIVATIVES (see also Codeine; Morphine)
effects on labyrinth, II: 2859
OPTICAL FILTERS, I: 894
effects on visual acuity, I: 894
use in color vision, IV: 4838
OPTICAL ILLUSIONS see Visual illusions
ORGANIC SOLVENTS (see also Carbon tetrachloride)
toxic effects, III: 2771
ORGANIZATIONAL ASPECTS see Administrative and organizational aspects

ORIENTATION see Biological orientation; Spatial orientation; Topographical orientation

ORIENTATION AND GUIDANCE see under Medical personnel

ORIGINALITY
psychological factors, IV: 4456
tests, IV: 3738

OTITIS EXTERNA (see also Pseudomonas in otitis externa), II: 1206, 2103, 2288; IV: 4527
treatment
use of:
sulfonamide compounds, II: 1535
terramycin, II: 1535

OTOLITHS see Labyrinth

OVULATION see Reproductive system

OXYGEN (see also Anoxia; Hyperoxia; Ozone)
measurement, III: 2525
tolerance see Hyperoxia tolerance

OXYGEN (STORED IN BODY)
effects of respiration, III: 2723

OXYGEN BREATHING (see also Hyperoxia), IV: 4142, 4966
at altitude, III: 2580
effects on:
altitude tolerance, I: 381, 621; III: 3185, 3341
alveolar oxygen tension, III: 3128
blood, II: 1578; III: 2752
blood oxygen tension, IV: 5126
blood pressure, IV: 4889
carbon monoxide poisoning, III: 2757
circulation, II: 1570; IV: 4631
color vision, I: 175
electrocardiogram, I: 607; IV: 4247
heterophoria, IV: 3836
lung, IV: 4283
memory, III: 3337
nitrogen elimination, I: 178, 179; II: 1561, 1756, 2036; III: 2433, 3130
respiration, II: 1034, 1433, 2165; III: 2437, 2615, 3129; IV: 3786, 4949
retinal circulation, II: 2096
work capacity, II: 1034; III: 2437, 3204; IV: 4685
general physiological effects, I: 630, 803
paradoxical effects, I: 223, 396; III: 2806, 3080

OXYGEN CONSUMPTION
effects of:
anoxia, I: 187, 469, 565; II: 988, 1036; III: 3289; IV: 4692, 4794, 4795
carbon dioxide, IV: 4947
cold, III: 2513, 2658; IV: 3788
drugs, III: 2434
ascorbic acid, III: 2658
chlorpromazine, IV: 3945
epinephrine, II: 2239
environmental temperature, III: 2434
heat acclimatization, III: 2457
hypothermia, III: 2965; IV: 4891
light stimuli, III: 2961, 3154
physical work, II: 939, 1000, 1352; III: 2613; IV: 4555
restraint, IV: 3788
subgravity, II: 992
measurement, III: 2465, 2621; IV: 4973
relation to:
body temperature, IV: 4794, 4795
lipid metabolism, IV: 4728
physical fitness, IV: 4187
temperature regulation, III: 2679; IV: 3788
sex factors, II: 1000

OXYGEN CONTAINERS, I: 588

OXYGEN DEFICIENCY see Anoxia

OXYGEN EQUIPMENT (see also Oxygen containers; Oxygen helmets; Oxygen masks; Oxygen regulators), I: 132, 133, 297, 454; II: 923, 1050, 1627; III: 2518, 2567, 2616, 3090, 3267, 3354, 3375, 3402, 3403, 3644, 3679; IV: 3707, 3858, 4147, 4206, 4722, 4858
evaluation, II: 1816
failure, I: 578; II: 1511; IV: 3706, 3708, 4929
test methods, III: 2318, 2525

OXYGEN HELMETS, I: 90

OXYGEN MASKS, I: 300, 642; II: 1253, 1467; III: 2604, 2618; IV: 4097
evaluation, I: 262
protection against explosive decompression, II: 1754
sterilization, III: 2769

OXYGEN METABOLISM (see also Oxygen consumption; Oxygen (Stored in body)), III: 2512

OXYGEN POISONING see Hyperoxia

OXYGEN REGULATORS
evaluation, III: 2861

OXYGEN SOURCES, III: 2697

OXYGEN TENSION see under Blood; Tissues. Also see Alveolar oxygen tension

OXYGEN TOLERANCE see Hyperoxia tolerance

OZONE
toxic effects, I: 732

PAIN
caused by sound, II: 1453
effects on sensory perception, IV: 3821
relation to:
auditory perception, III: 2788
tissue trauma, III: 3095
visual perception, III: 2788

PAIN SENSITIVITY
effects of cold, III: 3537; IV: 5048
PANCREATIC RHYTHM, IV: 3771
PANELS see Instrument panels
PANTOPON see Opium
PARABIOSIS, I: 491; II: 1582; III: 2937, 2938
PARACHUTE HARNESSES, III: 2324; IV: 4369
evaluation, I: 666
PARACHUTE JUMPING, I: 421, 534, 751, 809; II: 2229, 2230; IV: 4628
acceleration, IV: 4559
cause of:
hand injuries, IV: 4746
leg injuries, III: 3276
in winter, III: 3551
use of medical kits, III: 2394
PARACHUTE MEDICAL TEAMS, II: 1896, III: 2363; IV: 4581
PARACHUTE RIGGING
tests, II: 960
PARACHUTE TRAINING, IV: 4750
PARACHUTES
evaluation, II: 962; III: 3682
PARACHUTING INJURIES
analysis, IV: 4578
PARADOXICAL EFFECTS see under Oxygen breathing
PARANASAL SINUSES (see also Sinus barotrauma)
effects of airplane flight, II: 1362
PARASYMPATHETIC NERVOUS SYSTEM see Autonomic nervous system
PARSIDOL
use in motion sickness, I: 236
PASSENGER COMFORT, II: 1635, 1692, 1735; III: 3045
PASSENGER TRANSPORTATION (see also Air transportation of patients)
medical problems, II: 1076, 1773, 1870, 2259, 2260
safety, I: 395
sanitary aspects, I: 431; IV: 4934
PATELLAR REFLEX
effects of vibration, III: 3405
PATHOLOGY see under names of organs, e.g., Heart, pathology. Also see entries under Diseases, Disturbances, and Sicknesses
PATIENTS (see also Air transportation of patients)
morale, II: 2041
rehabilitation, III: 3677
PATTERN DISCRIMINATION, II: 1424; III: 2869; IV: 4292
role of memory, IV: 3756
PEDALS
human engineering, I: 627; IV: 3907
PEER RATINGS see subdivision Rating
PELVIS
mechanical properties, IV: 4129
PEPTIC ULCER
incidence in aviators, IV: 4131, 4556
relation to:
flight duty, III: 2639
personality, IV: 4313
PERCEPTION see Sensory perception
PERCEPTUAL DEPRIVATION see Sensory deprivation
PERCEPTUAL-MOTOR PERFORMANCE see Psychomotor performance
PERFORMANCE (see also Decision making performance; Listening p.; Mental p.; Neuromuscular p.; Psychomotor p.; see also under the various personnel categories, e.g., Pilots, performance)
effects of motivation, IV: 4186
PERIPHERAL PRESSURE
effects on:
circulation, II: 1064; III: 2841; IV: 4821
respiration, II: 1064
measurement, I: 505
PERIPHERAL VISION, II: 1030
PERIPHERAL VISION
effects of positive acceleration, IV: 4531
effects of training, IV: 3963
relation to:
color vision, II: 1939
dark adaptation, II: 1120
depth perception, III: 2671
night vision, I: 420; II: 2046
tests, IV: 4938
thresholds, II: 1122, 1781
time factors, II: 989, 2158; IV: 4938
transfer of training, III: 2589
PERISCOPES
effects on depth perception, IV: 4112
use in piloting, IV: 3920, 4112
PERSONALITY (see also under the various personnel categories, e.g., Pilots, personality. See also Leadership; Originality), IV: 4368
analysis, II: 1557; IV: 4424
relation to:
accident proneness, IV: 4154, 5083
anxiety, II: 1632
claustrophobia, IV: 4467
decision making performance, IV: 3857
dental disturbances, II: 1787; III: 3167; IV: 4607
electroencephalogram, IV: 4792
flying ability, IV: 4168
mental performance, IV: 3736

peptic ulcer, IV: 4313
physical fitness, IV: 4426
success, IV: 4860
visual acuity, IV: 4046
test methods (see also Personality tests), II: 1413; IV: 3936; 4424, 4640, 5202
tests, IV: 4183

PERSONALITY TESTS (see also Sentence completion test; Stipple test), I: 82, 112, 846, 847; II: 1011, 1041, 1365, 1412, 2025, 2196; III: 2378, 2383, 2472, 2926, 2977, 2978, 3026, 3149, 3164, 3187, 3188, 3258, 3389, 3565, 3656, 3660; IV: 3711, 3784, 3863, 4121, 4195, 4421, 4425, 4873, 4935, 5200
relation to personnel performance, III: 2947, 3250
results
effects of anoxia, IV: 4688

PERSONNEL (see also Aviators; Electricians; Electronics technicians; Instructors; Maintenance personnel; Medical personnel; Munitions specialists; Noncommissioned officers; Officers; Radar operators; Teams; Traffic control operators; Trainees; Veterinarians; Weather observers)
age factors, I: 678
attitudes, I: 113, 146, 493, 851, 913; II: 1273, 1560, 2287; III: 2338, 2942, 3295; IV: 4252
test methods, III: 3616
classification, I: 74, 239, 311, 389, 390, 391, 394, 429, 497, 560, 604, 700, 736, 746, 832, 833, 834, 908, 910, 912, 913, 914, 915; II: 1059, 1197, 1229, 1277, 1407, 1415, 1469, 1618, 1619, 2140, 2169, 2193, 2290, 2291, 2292, 2295, 2296; III: 2764, 3101; IV: 3728, 4258, 4550
identification, I: 279
incidence of diseases, IV: 4089
maintenance, I: 265, 522
medical care, III: 3450; IV: 4258, 5021
occupational deafness, I: 641, 663, 743, 976; II: 1704, 2042; III: 2663, 3183
occupational diseases, I: 320; III: 3008, 3183
performance
relation to personality tests, III: 2947, 3250
test methods, I: 329, 599; II: 1370
physical fitness, II: 1924; III: 2627
statistics, IV: 3937
rating, I: 585; II: 1412, 1584; III: 2500, 2940, 2943, 3421, 3656; IV: 4191
regional factors, II: 1780; IV: 4236
research, I: 76
selection, I: 91, 111, 228, 281, 318, 494, 522, 560, 700, 841, 842, 846, 851, 916; II: 1021, 1168, 1260, 1406, 1606, 1619, 1643, 1743, 1924, 2026, 2077, 2188, 2189, 2190, 2191, 2193, 2204, 2281, 2287; III: 2510, 2559, 2578, 2732, 2807, 3297, 3392, 3396, 3669, 3670; IV: 3728, 4181, 4258, 4550, 4553
India, IV: 4490
training, I: 111, 124, 374, 432, 493, 494, 879; II: 1018, 1019, 1406, 1470, 1628, 2114; III: 2338, 2627, 2942, 3175, 3176
attrition
psychological factors, IV: 4478
prediction of success, IV: 3823, 4236

PERSONNEL (NEGRO)
classification, II: 1595

PERSPIRATION (see also Sweat; Sweat glands)
effects of:
anxiety, II: 1766, 1767
chlorpromazine, IV: 3979
environmental temperature, II: 1563, 1564, 1565, 1766, 1767; IV: 4975
heat, III: 2892, 3675; IV: 5052
humidity, II: 1564; IV: 4447, 4455
physical work, III: 2709, 2892; IV: 4975
posture, III: 2927
water intake, III: 2709; IV: 4435
weather, IV: 4580
effects on:
skin temperature, IV: 3822
measurement, II: 1766, 1767, 1986
physical factors, II: 2161; III: 3148; IV: 4454
relation to:
blood sugar, III: 2892
temperature regulation, IV: 4454

PERTUSSIS see Whooping cough

PERVITIN see Ephedrine

pH see under Blood; Cerebrospinal fluid; Urine. Also see Acidosis; Alkalosis

PHARMACISTS
duties, III: 3369

PHENERGAN see Promethazine

PHOBIAS see Anxiety

PHOSPHATES see Phosphate content under Blood

PHOSPHENES, II: 2079, 2531

PHOSPHORUS METABOLISM
effects of:
anoxia, II: 1496, 1793, 2111
cold, IV: 4710
heat, IV: 4439
relation to anoxia tolerance, III: 2776

PHOTORECEPTORS
physiology, II: 2278

PHOTOSYNTHESIS see under Algae

PHOTOSYNTHETIC GAS EXCHANGERS see Use as gas exchanger under names of plants, e.g., Algae, use as gas exchanger

PHRENIC NERVE
action potentials
effects of apnea, IV: 4071

PHYSICAL EXAMINATION (see also Examination under names of organs, e.g., Eye, examination), I: 610, 684, 905; II: 1077, 1483; III: 2400, 2521, 2650, 3265; IV: 3761, 4163
follow-up studies, I: 684, 685; II: 1483
laboratory facilities, IV: 3710
PHYSICAL EXERCISE see Physical work
PHYSICAL FITNESS (see also under Aviators; Personnel; Pilots; see also items under Hearing requirements and Visual requirements), I: 265, 876, 879
analysis, II: 1619
effects of:
activity rhythm, IV: 4799
diet, II: 1848; III: 2990, 3343
physical work, IV: 4187
tobacco, I: 332
handbooks and treatises, III: 2934
psychological factors, I: 590
relation to:
age, II: 1298; III: 3272; IV: 4096
blood pressure, III: 2648
electrocardiogram, III: 3050
leadership, III: 2964
oxygen consumption, IV: 4187
personality, IV: 4426
respiration, IV: 4187
somatotype, IV: 4075
sport activities, I: 361; II: 1800, 1908, 2263; III: 2824, 2935, 3190, 3310
statistics, II: 1899; III: 3044
test methods (see also Step test), I: 332, 334, 564; II: 1313, 1643, 1743, 2168; III: 2404, 2559, 3025, 3360, 3626; IV: 4553
PHYSICAL WORK (see also Sport activities; Step test; Work capacity)
cause of:
fainting, IV: 4494
fatigue, III: 3229, 3570
neuromuscular reactions, III: 2930
effects on:
adrenal glands, II: 2220
alveolar carbon dioxide tension, II: 1035, 1686
blood catalase content, III: 2801
blood cells, I: 348; II: 2220; III: 2748; IV: 4967
blood oxygen tension, IV: 5126
blood pressure, IV: 4464, 4481
body fat, I: 670
body temperature, II: 1812; III: 2617, 2892, 3674
circulation, I: 115, 878; II: 1838; IV: 4555
cerebral circulation, III: 3432
cutaneous circulation, IV: 4364
pulmonary circulation, III: 2430, 3466
decompression sickness, III: 2433
heart function, III: 1945; IV: 5053
ballistocardiogram, III: 2504
electrocardiogram, III: 3683; IV: 4486
pulse rate, I: 878; II: 1644
metabolism, II: 1812; III: 2732, 3152, 3534, 3574, 3587
oxygen consumption, II: 939, 1000, 1352; III: 2613; IV: 4555
metabolism of organs
brain, III: 3432
metabolism of substances
ketones, III: 3417
lipids, IV: 3813
muscular function, I: 854
muscular system, I: 257, 854
myoglobin, IV: 4013
neuromuscular performance, III: 3570
nitrogen elimination, III: 2433
perspiration, III: 2709, 2892; IV: 4975
physical fitness, IV: 4187
psychomotor performance, II: 1131
respiration, I: 115, 878; II: 1208, 1416, 1686, 1812; III: 2436, 2615, 2617, 3084, 3109, 3288, 3371, 3395, 3575, 3587; IV: 3786, 4555, 5163
sweat composition, III: 2343, 2892
thrombocytes, IV: 4967
urine composition, III: 2722, 3229
voluntary apnea, IV: 5163
fatigue, II: 1282, 1883; III: 3570
general physiological effects, II: 1812; III: 2431, 3209, 3219, 3407; IV: 4907
in piloting, III: 3109
role in:
pilot candidate training, IV: 4516
training, I: 335
PHYSIOLOGICAL TELEMETRY, II: 1457; III: 2442, 3331, 3645
PHYSOSTIGMINE
effects on color vision, II: 1682
PIGMENT HORMONE see Intermedin
PILES see Hemorrhoids
PILOCARPINE
effects on anoxia tolerance, I: 608
PILOT CANDIDATES
nutritional requirements, II: 1352
performance
test methods, IV: 4020
personality, III: 2947, 3568
prediction of success, III: 3323, 3391; IV: 3724
selection, III: 3050, 3168; IV: 3725, 3726, 4386, 5025, 5076

training, IV: 5139
prediction of success, IV: 5076
role of physical work, IV: 4516
PILOT ERROR see Accidents, human factors
PILOT TRAINEES see Pilot candidates
PILOTING (see also Fighter plane piloting; Jet plane piloting)
disturbances of spatial orientation, II: 1238; III: 2592; IV: 3884, 3973
effects on:
blood sugar, I: 589
electrocardiogram, II: 1457
eye movements, I: 325, 646, 647, 648; IV: 5135
fatigue, I: 33, 326; III: 2329, 3229; IV: 4030
physical work, III: 3109
role of equilibrium, IV: 4863
spatial orientation, IV: 3973
training devices (see also Flight simulators), IV: 5090
use of:
auditory signals, IV: 4092
electronic equipment, II: 1953, 1954, 1955, 2084, 2289; IV: 4291
periscopes, IV: 3920, 4112
tactile signals, IV: 4348
visual cues, IV: 4223
visual displays, III: 2739, 2950, 3387
visual illusions, IV: 4501
PILOTS (see also Helicopter pilots; Jet plane pilots)
age factors, I: 43, 44, 210, 211, 212, 213, 482, 596; II: 930, 1771, 1822; III: 2365, 2577, 2690, 2721, 2985, 3138, 3223, 3399, 3646; IV: 4096, 4166, 4583, 4687, 4992
attitudes, II: 1772; III: 3320
attrition, IV: 4687
certification, I: 9, 44; IV: 3980, 4887, 4933
classification, II: 1715
dental requirements, III: 2981
neuropsychiatric fitness, II: 1848; III: 2796, 3073
nutrition, III: 3588
occupational deafness, II: 976; IV: 4399, 5082
occupational diseases, I: 638; III: 3300; IV: 4556, 4665
performance (see also Accident proneness; Flying ability; Piloting), I: 145, 169, 327, 606, 646, 747, 804; II: 1213, 1238, 1362, 1879; III: 2592, 2641; IV: 5084
analysis, II: 1569; III: 3034
effects of:
acceleration, IV: 3752
alcohol, I: 804; II: 936; III: 2360
amphetamine, I: 353, 804
training, IV: 4010
relation to:
age, II: 1822; III: 3110; IV: 4921
depth perception, IV: 4134
neuromuscular reactions, III: 2930
test methods, I: 329, 599; III: 3562
personality, I: 327, 358, 676, 904; II: 1362; III: 3164; IV: 4792
physical fitness, II: 1341, 1800, 1848, 2153; III: 2306, 2400, 2612, 2985, 3226, 3325, 3507; IV: 4675, 4788, 5042
rating, III: 2641; IV: 5084
selection, I: 49, 113, 139, 562, 690, 693, 702, 708, 908, 909; II: 1042, 1043, 1134, 1230, 1312, 1314, 1401, 1403, 1435, 1621, 1715, 1737, 1857, 1874, 2004, 2018, 2280; III: 2378, 2445, 2464, 2638, 2648, 3072, 3235, 3271, 3296, 3323, 3390, 3521; IV: 4167, 4474, 4863, 4936
India, III: 2400
Switzerland, II: 1947, 2263; III: 3018
training, I: 83, 117, 158, 283, 361, 550, 706, 707, 909; II: 1085, 1134, 1382, 1409, 1568, 1715, 1763, 1802, 1844, 2113, 2176, 2270; III: 2935, 3006, 3073, 3184, 3090, 3321, 3390; IV: 4167, 4678, 4883, 5075, 5090
attrition, III: 2370, 2372, 2421, 2574, 3608; IV: 3726, 3765
psychological factors, IV: 5125
cause of neuroses, III: 2638
effects on:
performance, IV: 4010
France, IV: 5078
handbooks and treatises, IV: 4110
prediction of success, I: 255, 328, 495; II: 1403; III: 2444, 2763, 2947, 3103; IV: 4484, 4497
psychological factors, I: 78
Switzerland, II: 2263
use of motion pictures, IV: 4274, 4742, 4933
visual requirements, III: 2979; IV: 3712, 4700
PITCH DISCRIMINATION, I: 463, 464
effects of speaking, III: 2497
role of cochlea, IV: 3715
test methods, III: 3333
PITRESSIN see Vasopressin
PITUITARY GLAND see Hypophysis
PLANETARY ATMOSPHERES, I: 810; II: 2146, 2147
PLANETARY EXPEDITIONS, IV: 4851
PLANETS (see also Mars; Venus)
atmosphere see Planetary atmospheres
life conditions, III: 2462, 2493, 2702; IV: 4432, 4851, 5027, 5060
PLANTS see Algae; Edible plants
PLASMA see Blood plasma
PLASMA VOLUME see Blood plasma volume
PLASMALOGEN see Blood, plasmalogen content

PLASTIC SURGERY, I: 694

PNEUMOTHORAX
effects of altitude, I: 12, 715; II: 1153
effects on air transportability, I: 12, 715

POISONING see Carbon monoxide poisoning; Food poisoning; Hyperoxia (Oxygen poisoning). Also see entries under Toxic effects

POISONOUS SUBSTANCES (see also Substances listed under Toxic effects)
general physiological effects, II: 953; III: 3065, 3221
handbooks and treatises, II: 953
research, I: 766
toxicity, IV: 3700, 4090
effects of altitude, II: 953
reviews, IV: 4994

POLIOMYELITIS
effects on air transportability, I: 507; III: 3490; IV: 5177

POLYCYTHEMIA
effects on time reserve, IV: 4622
relation to:
altitude tolerance, IV: 4622
anoxia tolerance, III: 3582

POSITION see Posture; Prone position flight; Retinal image position; Supine position flight; Tilting

POSITION ESTIMATION
in visual displays, IV: 3755

POSITIVE ACCELERATION see Acceleration (Positive)

POSTAFENE
use in motion sickness, I: 235, 236; II: 1224, 1226, 1227, 1509

POSTDECOMPRESSION SHOCK, I: 727; II: 1269

POST-MORTEM FINDINGS see under Brain, effects of anoxia

POSTURAL CHANGE (see also Tilting)
effects on:
blood pressure, III: 3131
cardiovascular system, III: 3606
cerebrospinal fluid pressure, III: 2725, 2726
circulation, IV: 3898
pulse rate, III: 3131
respiration, III: 3606

POSTURE (see also Prone position flight; Supine position flight)
effects on:
acceleration tolerance, I: 631; IV: 4061
bailout, III: 2330
blood pressure, IV: 4481
circulation, I: 392, 591; III: 3479; IV: 4128
depth perception, III: 2675
epinephrine excretion, IV: 4128
muscular strength, IV: 4387, 4829
perspiration, III: 2927
pulse rate, I: 591
reaction time, III: 3539
respiration, II: 1013; III: 3174; IV: 3855, 4624
spatial orientation, II: 2238; III: 2821
thrombocytes, IV: 4967
urine composition, IV: 3935
relation to motion sickness, IV: 4420

POTASSIUM METABOLISM (see also Electrolyte distribution. See also Potassium content under Blood. See also entries under Sodium-potassium ratio)
effects of:
altitude, II: 2206
altitude acclimatization, II: 2206
anoxia, II: 1266; IV: 4601, 4602
carbon dioxide, II: 1266; IV: 3892
positive acceleration, IV: 3910
role of:
adrenal glands, IV: 4602, 4817
autonomic nervous system, IV: 4602
liver, IV: 4601

POTENTIALS see Standing potential. Also see entries under Action potentials; Electrical potentials

PRACTICE (see also Learning; Training)
effects on:
psychomotor performance, I: 734, 735; II: 948, 1405, 1726, 1727, 2098, 2186; III: 2529, 2535, 3089; IV: 4156, 4158
speech intelligibility, III: 2535
vigilance, III: 2537

PREADAPTATION see Effects of preadaptation under Dark adaptation; Retinal adaptation

PREDICTION OF SUCCESS see under Aviators, training; Officers, training; Personnel, training; Pilot candidates; Pilot candidates, training; Pilots, training; Radio operators, training; Teams

PREDISPOSITION see under Epilepsy; Motion sickness. Also see items under Proneness

PREGNENOLONE see Progesterone

PRESERVATION see under Food

PRESSURE see Abdominal pressure; Barometric pressure; Blood pressure; Cerebrospinal pressure; Intrapulmonary pressure; Peripheral pressure; Tissue pressure

PRESSURE BREATHING (see also Artificial respiration; Intrapulmonary pressure; Negative pressure breathing), I: 570; II: 1033; IV: 4142
analysis, II: 1335
cause of:
apnea, IV: 5160
hyperventilation, II: 1521; IV: 5111
effects on:
ballistocardiogram, II: 1191

blood, II: 1651

blood oxygen tension, I: 452

blood pressure, I: 131, 397, 399, 406, 452; II: 1657, 1968; III: 2827, 2835, 2951; IV: 4249

body fluid distribution, IV: 4116

circulation, II: 131, 397, 399, 406; II: 1140, 1141, 1142, 1651, 1964; III: 2826, 3189; IV: 4116, 4379, 4898, 4945, 5111

electrocardiogram, I: 452, 607

heart function, II: 1657

lung, II: 1656; III: 3340

pulmonary circulation, II: 1897; III: 3388

respiration, I: 397, 399, 451; II: 1521, 1651, 1968, 2165, 2252; III: 2465, 2727; IV: 3772, 5160

respiratory movements, III: 2683

sodium metabolism, IV: 4379

tissue pressure, IV: 4117

general physiological effects, II: 1651, 1655, 1656, 1657, 1658; III: 2604

role of abdominal pressure, II: 1105

PRESSURE CABINS, I: 297, 504, 561; II: 1942; III: 3127

air conditioning, I: 297; IV: 4882

hazards

test methods, III: 3259

human engineering, I: 297; II: 1692, 1740, 1805, 2043; III: 3180; IV: 5174

PRESSURE CELLS see Emergency pressure cells

PRESSURE GAUGES, IV: 3975

PRESSURE GRADIENT see under Ear

PRESSURE HELMETS

evaluation, III: 2342

PRESSURE SUITS see Altitude suits; Anti-g suits; Emergency pressure cells; Space suits

PRETRAINING see Verbal pretraining

PRIMAQUINE

effects on altitude tolerance, III: 2583, 2584

PRINTED WORDS

recognition, III: 2952

PROBABILITY DISCRIMINATION

in psychomotor performance, IV: 5191

PROBANTHINE

use in motion sickness, I: 336

PROCAINE AND DERIVATIVES

effects on anoxia tolerance, I: 398

PROGESTERONE AND RELATED DRUGS

general psychological effects, IV: 4936

PROMETHAZINE

use in motion sickness, I: 142, 230, 231, 233, 235, 382, 768; II: 1224, 1226, 1227

PRONE POSITION FLIGHT, I: 764

effects on acceleration tolerance, I: 92, 478

field of vision, I: 23, 326

PRONENESS see Accident proneness; Anxiety proneness; Motion sickness, predisposition

PROPRIOCEPTION (see also Motion perception (passive))

effects of:

rotation, II: 1670; III: 2931

subgravity, IV: 4964

role in:

psychomotor performance, II: 1448; IV: 3764, 4152, 5147

spatial orientation, I: 180, 617, 618, 619, 829, 872; III: 2594, 2595, 2596; IV: 5185

test methods, III: 3536

tests, I: 498

thresholds, III: 2840

PROSERINE see Neostigmine

PROSTHESES see Dental prostheses

PROTECTION see Eye protection; Fire protection; Protective equipment. Also see Protection under Acceleration (Negative); Airplane noise; Cold; Cosmic rays; Explosive decompression; Glare; Heat; Thermal radiation; Wind blast

PROTECTIVE CLOTHING see Clothing

PROTECTIVE EQUIPMENT (see also Clothing; Emergency pressure cells; Goggles and glasses; Harnesses; Life rafts; Medical kits; Oxygen equipment; Parachutes; Safety belts; Warning devices. See also Equipment under Survival; Survival on water), I: 174, 274, 522, 622; II: 1806, 2016; III: 3483, 3583; IV: 4074

evaluation, II: 1814

PROTEIN METABOLISM (see also Nitrogen metabolism)

effects of:

altitude, II: 1794

cold, III: 2888

starvation, IV: 4381

stress, III: 2586

PSEUDOMONAS

in otitis externa, II: 1535, 2103, 2288

PSYCHIATRIC EXAMINATION see Neuropsychiatric examination

PSYCHIATRISTS

duties, I: 177; III: 3157; IV: 4630, 4783

PSYCHIATRY see Military psychiatry

PSYCHOLOGICAL EFFECTS see General psychological effects under Acceleration; Acceleration (Positive); Accidents; Airplane noise; Alcohol; Altitude; Amphetamine; Anoxia; Blast; Combat stress; Dimenhydrinate; Epilepsy; Explosive decompression; Fatigue; Flight duty; Free fall; High altitude flight; Hot climates; Instrument flight; Human isolation; Jet engine noise; Jet plane flight; Motion sickness drugs; Noise; Progesterone; Restraint; Scopolamine; Starvation; Stress; Subgravity; Supersonic flight; Training; Wind; X-rays

PSYCHOLOGICAL EXAMINATION see Mental ability, tests

PSYCHOLOGICAL FACTORS see under Accident proneness; Alertness; Anoxia tolerance; Anxiety; Auditory perception; Circulation; Depth perception; Fainting; Fatigue; Hypothermia; Learning; Mental performance; Messages, retention; Neuroses; Night vision; Originality; Personnel, training, attrition; Physical fitness; Pilots, training; Pilots, training, attrition; Psychomotor performance; Reaction time; Reasoning; Spatial orientation; Survival; Vigilance; Visual perception

PSYCHOLOGICAL INTERVIEWS, IV: 5178

PSYCHOLOGICAL TESTING (see also Achievement tests; Aptitude tests; Personality tests; Psychological interviews), IV: 4355, 4983

PSYCHOLOGY see Aviation psychology; Military psychology

PSYCHOMOTOR PERFORMANCE (see also Mirror vision performance; Neuromuscular performance; Reaction time; Target tracking), I: 78; II: 1568

- analysis, II: 1405, 1543, 1567, 1833, 1880, 1958; III: 2375, 2468, 2492, 2737, 2738
- bibliography, II: 985
- effects of:
  - acceleration, IV: 4822
  - advance information, II: 1720; III: 2758, 3077, 3336; IV: 4323
  - alertness, IV: 4591
  - altitude acclimatization, III: 2794
  - anoxia, II: 1186, 1835; IV: 4239, 5024
  - anxiety, I: 718; III: 2642, 3159; IV: 4276, 4603
  - auditory signals, IV: 4844
  - auditory stimuli, IV: 4375
  - carbon dioxide, I: 881; II: 2243
  - climate, II: 1918, 1919, 1920
  - clothing, IV: 4901
  - cold, III: 3537; IV: 5048
  - drugs, III: 2843, 2900, 3295
    - alcohol, IV: 3938
    - amphetamine, I: 353, 804; II: 1549, 1915
    - benadryl, II: 1549, 1914, 1915, 1916
    - caffeine, II: 1549
    - motion sickness drugs, IV: 4761
    - scopolamine, II: 1914, 1915, 1916; IV: 3716
  - environmental temperature, II: 1918, 1919, 1920, III: 3540
  - handedness, III: 3474; IV: 4251
  - hyperventilation, IV: 4540
  - illumination, II: 1732, 1770; IV: 3795
  - information feedback, IV: 4270, 4757, 4919
  - intermittent light, IV: 3795, 4445, 4446
  - mental stress, I: 884; III: 2642, 3472, 3663
  - motion sickness, IV: 3718
  - motivation, III: 3295
  - muscular tonus, III: 2333
  - noise, II: 2273; III: 2532, 2534
  - physical work, II: 1131
  - practice, I: 734, 735; II: 948, 1405, 1726, 1727, 2098, 2186; III: 2529, 2535, 3089; IV: 4156, 4158
  - rest, II: 947, 983, 1305, 1886; III: 2334, 2335, 2438, 3623
  - rhythmic ability, II: 1361
  - sensory illusions, III: 3363
  - sleep deprivation, II: 1131; IV: 3954
  - starvation, II: 1663
  - stress, I: 284; III: 2550
  - subgravity, II: 992
  - training, IV: 4603
  - verbal pretraining, II: 1764
  - vigilance, III: 2853
  - visual cues, III: 2778; IV:4223, 4342, 4475
  - visual signals, IV: 4844
  - visual stimuli, III: 2842
- effects on scale reading, IV: 4512
- fatigue, II: 1048, 1129, 2105; III: 2532, 2899, 2900, 3456; IV: 4323, 4757, 4758, 4760, 4953
- general physiological effects, IV: 4026
- general physiological factors, II: 1129
- probability discrimination, IV: 5191
- psychological factors, I: 78, 284, 718; II: 1090, 1091, 1129, 1257, 1397, 1667, 1999; III: 2374, 2900; IV: 4760
- relation to:
  - age, III: 3476
  - listening performance, IV: 4076
- research
  - Austria, II: 1015
  - Germany, II: 1015
  - Switzerland, II: 1015
- retention of training, I: 317, 414, 734; II: 1631
- role of proprioception, II: 1448; IV: 3764, 4152, 5147
- test methods, II: 951, 1058, 1401, 1406, 1624, 1995, 2018; III: 2735, 2899, 3491, 3493; IV: 4210, 4611, 4946
- tests, I: 158, 160, 161, 735; II: 946, 948, 1093, 1095, 1256, 1258, 1288, 1289, 1356, 1396, 1403, 1407, 1475, 1488, 1543, 1622, 1623, 1641, 1672, 1676, 1725, 1726, 1727, 1747, 1849, 1879, 1885, 1887, 1957, 1995, 1998, 2000, 2024, 2080, 2098, 2109; III: 2484, 2635, 3118, 3262, 3362, 3394, 3456; IV: 3694, 3796, 3839, 3948, 3991, 4251, 4318, 4445, 4672, 4686, 4714, 4726, 4894, 4937
- time factors, II: 1724; III: 2376, 2491, 2643, 3082, 3089, 3533; IV: 4006, 4234, 4591, 5147, 5148

transfer of training, I: 163, 317, 414, 520; II: 984, 986, 987, 1037, 1342, 1343, 1346, 1485, 1487, 1547, 1548, 1639, 1733, 1802, 1891, 2113, 2186; III: 2336, 2376, 2381, 2382, 2456, 2758, 2772, 2803, 2900, 3082, 3222; IV: 4209, 4269, 4271

PSYCHONEUROSIS see Neuroses

PSYCHOSOMATIC MEDICINE
relation to aviation medicine, IV: 4991

PSYCHOTHERAPY see Anxiety, treatment; Neuroses, prevention and treatment

PTOSIS see Eye diseases

PULMONARY CIRCULATION, I: 305; II: 1323
effects of:
anoxia, I: 106, 107, 128, 129, 304, 568, 569; II: 1045, 1339, 1340, 1471, 1526, 1979, 2053, 2144, 2145; III: 2413, 2621, 2904, 3240, 3466, 3511, 3647; IV: 4001, 4150, 4328, 4528, 4954
carbon dioxide, II: 2145
carbon monoxide, II: 1339
composition of respiratory gases, IV: 4086
hyperoxia, II: 1045, 2145
nitrogen breathing, II: 1930
physical work, III: 2430, 3466
pressure breathing, II: 1897; III: 3388
measurement, III: 2621
relation to:
blood pressure, II: 2048
nitrogen elimination, III: 2430

PULMONARY TUBERCULOSIS see Tuberculosis

PULMONARY VENTILATION see Respiration

PULSE RATE
effects of:
altitude, I: 591
altitude acclimatization, III: 3131
anoxia, II: 1945, 1644; III: 2819, 2936; IV: 4059
carbon dioxide, III: 3430
electrical stimuli, IV: 5142
epinephrine, III: 2591
fatigue, III: 3515
heat, II: 1520; III: 3675
hypothermia, III: 2591
noise, IV: 4864
physical work, I: 878; II: 1644
postural change, III: 3131
posture, I: 591
sound, IV: 5201
vitamin E, III: 2819
voluntary apnea, I: 705; II: 1943; III: 3515
relation to:
altitude tolerance, II: 2286; III: 3680; IV: 5194
electroencephalogram, II: 1591

PULSE RATE RHYTHM
relation to:
activity rhythm, III: 3013
diurnal cycle, IV: 4353

PUPIL SIZE
effects of anoxia, I: 312
relation to visual acuity, III: 2340

PUPILLARY REACTIONS, II: 1426
effects of fatigue, III: 3121

PURINE AND DERIVATIVES
effects on anoxia tolerance, III: 2647

PURSUIT TRACKING (see also Rotary pursuit tracking), I: 159, 161, 163, 574, 718; II: 986, 987, 1037, 1090, 1091, 1129, 1131, 1163, 1356, 1396, 1472, 1473, 1487, 1624, 1725, 1880, 1885, 1887; III: 2381, 2382, 2386, 2772, 3522; IV: 4234, 4250, 4269, 4445, 4446, 4603, 4714, 4808, 4894, 4937
equipment, IV: 3730, 3731
training devices, I: 873, 874, 951

PYRAMIDON see Aminopyrine

PYRIBENZAMINE
use in motion sickness, II: 1509

PYRIDINE AND DERIVATIVES
effects on anoxia tolerance, III: 2647

PYRIDOXINE
use in motion sickness, II: 2219

PYROGENIC AGENTS
effects on body temperature, IV: 3949

PYRROLAZOTE
use in motion sickness, I: 235, 236; II: 1226

QUARANTINE see under Communicable diseases

QUININE AND DERIVATIVES (Chloroquine)
contraindication for aviators, IV: 4289
effects on:
circulation, II: 1245
visual accommodation, II: 1245

RACE see Race factors under Cold, effects on circulation; Cold, general physiological effects; Dark adaptation; Metabolism, effects of cold; Sicklemia; Temperature regulation. Also see Personnel (Negro)

RADAR EQUIPMENT
human engineering, II: 1247, 1486

RADAR OPERATION, I: 183, 199, 239, 480, 658, 775; II: 1291, 2140; III: 3177
eye movements, I: 370
fatigue, I: 370; II: 2005; III: 2466
physical factors, IV: 4931
relation to brightness discrimination, IV: 4212
retinal adaptation, I: 480
test methods, II: 1049, 1158, 1187
tests, IV: 4213
training devices, IV: 3988

visual perception, I: 183

RADAR OPERATORS

occupational diseases, IV: 4765

performance

tests, II: 1442

selection, II: 1087

training, III: 2352

RADAR SIGNALS

intelligibility, I: 184; II: 1025, 1049, 1128; III: 2759, 2760

effects of retinal adaptation, I: 199; II: 1159

RADIATIONS see Ionizing radiations; Microwave radiation; Solar radiation; Thermal radiation. Also see items under Rays

RADIO EQUIPMENT

for emergencies, III: 3318

RADIO OPERATORS

occupational deafness, III: 3215; IV: 3719

selection, II: 1197, 1336, 1716, 2294; IV: 4189

training, IV: 3704, 4189

prediction of success, IV: 4157

RADIO TRANSMISSION (PHYSIOLOGICAL) see Physiological telemetry

RADIOGRAPHY see Roentgenography

RADIOISOTOPES

use in acceleration stress studies, III: 3477

RAFTS see Life rafts

RANGE FINDING see Depth perception

RATING see under the various personnel categories, e.g., Instructors, rating

RATIO see entries under Sodium-potassium ratio

RATIONS see Emergency rations

RAYS see Cosmic rays; Ultraviolet rays; X-rays. Also see items under Radiations

REACTION TIME, I: 357; II: 1257, 1567; IV: 4070

effects of:

acceleration, III: 3539

altitude, III: 3539

anxiety, IV: 4276

auditory signals, II: 2123

auditory stimulus intensity, III: 2994

fatigue, II: 1645; III: 3163

heat, IV: 4179

light stimuli, II: 2002

motion sickness drugs, III: 3062

posture, III: 3539

sleep deprivation, IV: 3954

task complexity, II: 1290

training, III: 3163

vigilance, III: 3539

visual signals, I: 793; II: 1613, 1862, 2123; III: 2446

visual stimuli, II: 1058; III: 2842

in supersonic flight, IV: 4070

measurement, II: 1058, 1869; III: 3491

physical factors, IV: 4470

psychological factors, II: 1641; III: 3627

relation to age, III: 3136, 3476; IV: 3844, 3869

reviews, II: 1645

tests, II: 1958; III: 3165

REACTIONS see Neuromuscular reactions; Pupillary reactions

READING see Scale reading. Also see entries under Legibility

READING INTEREST, II: 1671

REASONING (see also Decision making performance)

effects of:

anoxia, III: 3133, 3134

anxiety, II: 1761

fatigue, II: 1760

mental stress, II: 1761

starvation, II: 1663

psychological factors, III: 3384, 3659; IV: 4456

test methods, I: 429; II: 1229

tests, III: 3660; IV: 4840

RECEPTORS see items under Sense organs

RECOGNITION see under Moving objects; Printed words. Also see subdivisions Intelligibility; Interpretation; Legibility

REFLEXES (see also Carotid sinus reflexes; Conditioned reflexes; Patellar reflex)

effects of:

altitude acclimatization, II: 1782

anoxia, II: 1782, 2300; III: 2962; IV: 4814

hypothermia, III: 2556; IV: 5038, 5039

REFRACTOMETRY, I: 895

REGENERATION see under Space cabin atmospheres

REGIONAL FACTORS see under Personnel

REHABILITATION see under Patients

REMOVAL see under Odors. Also see subdivision Disposal

RENAL CIRCULATION

effects of:

anoxia, II: 1101, 1102

hypothermia, IV: 4650

relation to anoxia tolerance, II: 1102

RENAL FUNCTION see Kidney function

REPRODUCTION see Fertility

REPRODUCTIVE SYSTEM (see also Menstruation; Testis; Uterus)
effects of anoxia, II: 1679

REQUIREMENTS see Rest requirements; Vitamin requirements. Also see items under Dental requirements; Hearing requirements; Nutritional requirements; Visual requirements

RESCUE (see also Air evacuation; Fire rescue; Parachute medical teams)
in the Arctic, IV: 4589
on land, III: 3081; IV: 4581
on water, II: 1785, 2257; III: 3318, 3578; IV: 4062, 4545, 4904, 5073

RESCUE MEDICAL TEAMS
Canada, IV: 5192

RESEARCH CENTERS see under Altitude; Auditory perception; Aviation medicine

RESEARCH METHODS see under Acceleration tolerance; Aviation medicine; Blast; Cold climates; Cosmic rays; High altitude flight; Hot climates; Kidney; Motion sickness; Respiration; Upper atmosphere; Vibration, general physiological effects

RESPIRATION (see also Apnea; Artificial respiration; Cutaneous respiration; Flack test; Hyperventilation; Nitrogen breathing; Oxygen breathing; Pressure breathing; Respiratory dead space; Respiratory gases; Respiratory movements; Valsalva maneuver; Vital capacity), II: 1978, 2029; IV: 3700, 4837
analysis, II: 1143, 1576, 1808; III: 2538, 2652, 2704, 2727, 3041
effects of:
abdominal pressure, II: 1064
airplane flight, II: 1743; IV: 4553
altitude, I: 451, 726; II: 1523; III: 2518, 2652, 2727, 2872, 2873, 3370, 3523, 3543; IV: 3943
altitude acclimatization, II: 1055, 1057, 1416, 1980, 1981, 2165; III: 2380, 2405, 2554, 2580, 3179; IV: 4780
alveolar carbon dioxide tension, II: 1035; III: 2626
anoxia, I: 101, 128, 165, 166, 304, 321, 401, 404, 451, 456, 469, 470, 568, 608, 630, 672, 726, 803; II: 988, 1055, 1056, 1057, 1098, 1147, 1476, 1839, 1979, 2091, 2129, 2283; III: 2388, 2488, 2587, 2753, 2820, 2962, 3127, 3289, 3371, 3395, 3597; IV: 3997, 4059, 4560, 4574, 5111, 5116
anti-g suits, IV: 5049
blast, II: 1242, 1243
blood loss, II: 1056
carbon dioxide, I: 101, 757, 822, 881; II: 1208, 1259, 1368, 1522, 1523, 1697, 2143, 2243; III: 2436, 2617, 3084, 3129, 3430, 3633; IV: 3997, 4947, 4949, 5026
cold air breathing, IV: 4517
conditioned reflexes, III: 3290, 3597
drugs, II: 1202
aminophylline, IV: 5026
anesthetics, II: 1276
antihistaminics, I: 165; II: 993, 1098, 1099
Dibenamine, I: 321
epinephrine, II: 2239; III: 3084
glucose, II: 1433
meperidine, IV: 5026
succinates, II: 1281
explosive decompression, II: 1477
heat, IV: 4148
hypercapnia, I: 166, 456; II: 1839; III: 2692
hyperoxia, II: 1696, 1697, 1739; III: 2418, 3530
hypothermia, III: 3273
intrapulmonary pressure, II: 1013
mental work, III: 3290
nasal stimulation, II: 2285
negative acceleration, I: 307, 309
oxygen breathing, II: 1034, 1697, 2165; III: 2437, 2615, 3129; IV: 3786, 4949
peripheral pressure, II: 1064
physical work, I: 115, 878; II: 1208, 1416, 1686, 1812; III: 2436, 2615, 2617, 3084, 3109, 3288, 3371, 3395, 3575, 3587; IV: 3786, 4555, 5163
postural change, III: 3606
posture, II: 1013; III: 3174; IV: 3855, 4624
pressure breathing, I: 397, 399, 451; II: 1651, 1968, 2165, 2252; III: 2465, 2727; IV: 3772, 5160
rotation, III: 3060
speaking, I: 171, 455
effects on:
altitude tolerance, IV: 4377
blood, II: 990
blood pressure, III: 3443
circulation, II: 1139, 1140, 1141, 1840
electromyogram, II: 1193, 1194
oxygen stored in body, III: 2723
general physiological factors, II: 1082, 1433; III: 2588, 3172, 3366; IV: 5179
measurement, II: 1234, 1545, 1743, 1777, 2122, 2242, 2284; III: 2465, 2515, 2541, 2745, 3171, 3287, 3344, 3418; IV: 4553, 4948, 5092, 5093, 5094
relation to:
age, II: 2091; III: 3288
blood carbon dioxide tension, III: 2872, 2873
circulation, III: 3023
metabolism, IV: 4091
physical fitness, IV: 4187

work capacity, III: 3286
research methods, IV: 3989
reviews, III: 2681, 3401
role of:
abdominal pressure, II: 1193, 1194; IV: 3921
brain activity, II: 1799
muscular function, II: 1193, 1194
RESPIRATORS, II: 932, 1575, 1845, 1977, 2051, 2074; III: 3658, 3686; IV: 3911, 4349
use in air transportation of patients, II: 2265
RESPIRATORY ADAPTATION, III: 3315
RESPIRATORY CENTER
physiology, IV: 5106
RESPIRATORY DEAD SPACE
measurement, III: 2743
RESPIRATORY DISEASES (see also Asthma; Lung, pathology; Tuberculosis; Whooping cough)
effects on air transportability, I: 303, 387, 785; II: 1153, 2160; III: 3508; IV: 4888, 5043
RESPIRATORY GASES
carbon dioxide see Carbon dioxide, in respiratory gases
composition, II: 1112, 1576; IV: 4573
effects on pulmonary circulation, IV: 4086
diffusion, II: 2036; III: 2745
relation to age, III: 2602
effects of apnea, II: 1100
RESPIRATORY MOVEMENTS
effects of pressure breathing, III: 2683
RESPIRATORY RHYTHM
relation to diurnal cycle, IV: 4353
RESPIRATORY SYSTEM see Adenoids; Lung; Nasal passages; Paranasal sinuses; Respiration
REST
effects on:
anxiety, II: 1097
neuromuscular performance, III: 3570
psychomotor performance, II: 947, 983, 1305, 1886; III: 2334, 2335, 2438, 3623
work capacity, II: 1092, 1094, 1096; III: 2485, 3220, 3231
REST REQUIREMENTS
effects of work load, IV: 3840
RESTRAINT (see also Human Isolation)
adaptation see Restraint adaptation
effects on:
body temperature, III: 2448; IV: 3788
brain sodium-potassium ratio, III: 2786; IV: 4204
cold tolerance, III: 2448
distribution of body fluids, III: 2786
oxygen consumption, IV: 3788
sulfhydryl metabolism, III: 2452, 3361
temperature regulation, III: 2450, 2451, 2920
general physiological effects, IV: 4037
general psychological effects, IV: 4037
RESTRAINT ADAPTATION, III: 2449
RESUSCITATION (see also Artificial respiration), II: 2149, 2155, 2252; III: 3423
from anoxia, III: 2830, 2956; IV: 3841, 5031
from hypothermia, IV: 4815
RESUSCITATORS see Respirators
RETENTION see under Messages
RETENTION OF TRAINING see under Psychomotor performance
RETICULOCYTES see Blood cells
RETICULO-ENDOTHELIAL SYSTEM (see also Hematopoiesis)
effects of altitude, IV: 5107
RETINA (see also Photoreceptors; Retinal adaptation; Retinal blood vessels; Retinal circulation; Retinal image position; Rhodopsin)
action potentials see Electroretinogram
effects of light stimuli, II: 2112
electrical potentials see Electroretinogram
histology, II: 1894
metabolism, II: 1882, 1948, 1949
RETINAL ADAPTATION (see also Color adaptation; Dark adaptation; Night vision), III: 2808; IV: 3768, 4952
effects of:
anoxia, I: 243, 247
light stimuli, I: 198, 294, 480, 864; II: 1135, 1426
preadaptation, IV: 3695, 4658
xanthophyll, III: 3518
effects on:
electro-oculogram, IV: 4065
electroretinogram, II: 1135
intelligibility of radar signals, I: 199; II: 1159
visual perception, IV: 4998
vitreous humor, IV: 4952
in high altitude flight, I: 245
in night flying, I: 243, 247
in radar operation, I: 480
relation to:
brightness discrimination, III: 3227; IV: 3877
color vision, I: 200; II: 991, 1146, 1184, 1604, 1607, 1620; IV: 3757, 3877, 4639
depth perception, I: 434; II: 2187; III: 3409
eye movements, IV: 3748
visual acuity, III: 2340, 2546

visual perception, I: 197; II: 1030, 1126, 1136; III: 2895
role of rhodopsin, III: 3601
test methods, I: 741; II: 1067; III: 3143; IV: 4830
time factors, I: 199; III: 3440

RETINAL BLOOD VESSELS (see also Retinal circulation)
effects of:
altitude acclimatization, I: 680
anoxia, I: 680

RETINAL CIRCULATION
effects of:
anoxia, I: 502; II: 1693
hypercapnia, II: 1693
hyperoxia, II: 1693
oxygen breathing, II: 2096
positive acceleration, II: 1331, 1693
relation to:
age, II: 2096
blackout, II: 1693; III: 2682
cerebral circulation, II: 1570

RETINAL IMAGE POSITION (see also Foveal vision; Peripheral vision)
effects on:
brightness discrimination, IV: 4358
visual perception, III: 3602

RETINAL RIVALRY see Binocular vision

REVIEWS see under Acceleration tolerance; Blast, general physiological effects; Blast, general psychological effects; Carbon monoxide, general physiological effects; Carbon monoxide poisoning; Cold, pathological effects; Cosmic rays, biological effects; Fatigue; Flicker fusion frequency; Hibernation; Human engineering; Hyperthermia; Hypothermia; Mental fatigue; Motion sickness; Noise; Ocular dominance; Poisonous substances, toxicity; Reaction time; Respiration; Temperature regulation; Thermoreception; Vibration, general physiological effects. Also see entries under Handbooks and treatises

REVOLVING CHAIRS, II: 1527

RHINALGAN see Ephedrine

RHODOPSIN, II: 1385; IV: 4769
role in retinal adaptation, III: 3601

RHYTHMIC ABILITY
effects on psychomotor performance, II: 1361

RHYTHMS see Biological rhythms. Also see entries under Cycles

RIGHTHANDEDNESS see Handedness

ROCKET FLIGHT (see also Space flight)
medical problems, II: 1190, 1515

ROCKET PROPELLANTS (see also Hydrazine)
hazards, I: 465; III: 3037
toxic effects, I: 682; III: 3037

ROCKETS
human engineering, I: 364

ROENTGENOGRAPHY, III: 2765

RORSCHACH TEST see Personality tests

ROTARY PURSUIT TRACKING, I: 117, 284, 414; II: 1305, 1999, 2000; III: 2334, 2376
training devices, III: 3492

ROTATION (see also Spinning; Tilting; Tumbling)
adaptation see Rotation adaptation
cause of:
nystagmus, IV: 3864, 4588
visual illusions, I: 99, 253, 407, 424, 425, 616, 620; II: 1500, 1501, 1502, 1529, 1877; III: 2840, 2851, 2931
effects on:
auditory perception, II: 1837
autonomic nervous system, II: 1666
blood pressure, II: 1348
circulation, II: 1347; III: 2699, 3624
conditioned reflexes, II: 1670, 1898
electrical potentials of labyrinth, III: 2698; IV: 4666
electrocardiogram, III: 3060
electroencephalogram, III: 3060
heart function, II: 1347
labyrinth, I: 99, 253, 407, 424, 425, 616, 620, 750; II: 996, 1447, 1500, 1501, 1502, 1528, 1529, 1550, 1669, 1819, 1877, 1878, 1898, 2299; III: 3058, 3060, 3433, 3445, 3446
test methods, III: 3434
proprioception, II: 1670; III: 2931
respiration, III: 3060
general physiological effects, II: 1666; III: 3097
test methods, II: 1527
tolerance, III: 3624, 3625

ROTATION ADAPTATION, III: 2948

RUTIN
effects on cold tolerance, IV: 3727

SAFETY see under Air transportation of patients; Airplane flight; High altitude flight; Passenger transportation; Space flight. Also see Protective equipment

SAFETY BELTS, I: 56, 67, 310; II: 1296
hazards, II: 1551

SAFETY HARNESSES, I: 287; II: 935, 1388, 2052, 2276; IV: 4279, 4969, 5199

SALIVARY GLANDS
effects of atropine, II: 1612
metabolism
effects of heat acclimatization, IV: 3986

SALMONELLA, I: 149, 150; IV: 3830

SALT see Sea water intake; Sodium chloride

SALYRGAN
effects on kidney function, I: 108

SANITARY ASPECTS see under Airplane flight; Airplanes; Airports; Passenger transportation; Space cabin atmospheres. Also see Air purification; Communicable diseases, quarantine; Oxygen masks, sterilization

SANITARY FACILITIES see under Airplanes

SATELLITE FLIGHT
medical problems, IV: 4499

SATELLITES see Man-made satellites; Space stations

SCALE READING (see also Vernier acuity)
effects of psychomotor performance, IV: 4512
physical factors, III: 2425, 3453; IV: 5095
tests, IV: 3992, 4939
time factors, IV: 4940, 5095

SCARLET FEVER, I: 773

SCHOOL OF AVIATION MEDICINE (U.S. AIR FORCE), II: 2142; III: 3155, 3531; IV: 4732, 5097

SCHOOL OF AVIATION MEDICINE (U.S. NAVY), II: 949

SCHOOLS see under Aviation medicine

SCOPODEX
use in motion sickness, I: 231

SCOPOLAMINE AND DERIVATIVES (Hyoscine)
administration, II: 1611, 2180; IV: 3956, 3959
effects on:
fatigue, IV: 4757
mental performance, I: 689; II: 1917; IV: 3716
psychomotor performance, II: 1914, 1915, 1916; IV: 3716
general psychological effects, II: 1890
use in motion sickness, I: 4, 234, 235, 382, 689; II: 1223, 1224, 1225, 1226, 1227, 1228, 2180; IV: 3956, 3959, 4450, 4715

SCOTOPIC VISION see Night vision

SEA RESCUE see Rescue on water

SEA WATER INTAKE
general physiological effects, IV: 3758

SEALED ANIMALS CONTAINERS see Animal containers (Sealed)

SEALED CABINS
air conditioning, I: 250, 792
human engineering, I: 250; III: 2728

SEARCHING see Aerial searching; Visual searching

SEAT BELTS see Safety belts

SEATS (see also Ejection seats)
human engineering, I: 286, 426, 603, 627; II: 1297, 1440, 1551, 2087; III: 2848, 3322, 3503; IV: 3692, 3922, 4135, 4321, 4748

SECRETIONS see Gastric secretion; Milk; Sweat

SEDATIVE EFFECTS see under Antihistaminics

SELECTION see under the various personnel categories, e.g., Pilots, selection. Also see Prediction of success

SELYE SYNDROME see General adaptation syndrome

SEMICIRCULAR CANALS see Labyrinth

SENSE ORGANS see Chemoreceptors; Ear; Eye; Interoceptors; Thermoreceptors

SENSITIVITY see Pain sensitivity; Stress sensitivity

SENSORIMOTOR PERFORMANCE see Psychomotor performance

SENSORY AREAS see under Cerebral cortex

SENSORY DEPRIVATION
effects on urine composition, IV: 4690

SENSORY ILLUSIONS (see also Motion perception (Illusory); Visual illusions
cause of accidents, II: 1250
effects on psychomotor performance, III: 3363
relation to spatial orientation, I: 36; III: 3339

SENSORY PERCEPTION (see also Auditory perception; Olfactory perception; Pain; Proprioception; Tactile perception; Thermoreception; Visual perception), II: 1439
effects of:
pain, IV: 3821
subgravity, II: 992; III: 2863
research, II: 1449
role in spatial orientation, IV: 4472

SENTENCE COMPLETION TEST, IV: 5085

SERUM see Blood plasma

SEX FACTORS see under Oxygen consumption; Spatial orientation

SHAPE CONFIGURATION
relation to form perception, III: 2399

SHAPE PERCEPTION see Form perception

SHELDON TYPES see Somatotype

SHIVERING
role in temperature regulation, IV: 4028

SHOCK see Postdecompression shock

SHOCK WAVES see Blast

SHOES see Boots

SHOULDER HARNESSES see Safety harnesses

SHOULDER INJURIES, II: 1388

SICK AND WOUNDED see Patients

SICKLEMIA
effects on air transportability, III: 2607, 2611, 2670, 2890, 3228; IV: 3798, 4308, 4557, 4974
race factors, III: 2607, 2611, 2670, 2890
relation to hemoglobin composition, IV: 4308

SICKNESSES see Altitude sickness; Decompression sickness; Motion sickness. Also see Diseases, Disturbances and subdivision Pathology

SIDE EFFECTS see under Motion sickness drugs

SIDE-TONE (see also Speech feedback)
effects on:
auditory perception, III: 3648
speaking, III: 2408, 3357
speech intelligibility, II: 1001; III: 2409, 2411; IV: 4773, 4923, 4925, 5064
SIGNAL LIGHTS (see also Color signals)
effectiveness, IV: 4686
visibility, I: 371; II: 1445, 1866, 1966; III: 2632
test methods, III: 2479
SIGNAL LIGHTS (FLASHING)
visibility, II: 1445
SIGNALS see Auditory signals; Color signals; Radar signals; Tactile signals; Visual signals; Warning devices
SIMULATORS see Flight simulators
SINUS BAROTRAUMA, III: 2666; IV: 3925, 4162
treatment, IV: 4057
SINUSES see Paranasal sinuses
SIZE see Body measurements; Pupil size
SIZE PERCEPTION, II: 979, 1046, 1162, 1614, 2116; III: 2813
effects of:
colors, II: 1086
illumination, II: 2009
visual stimuli, III: 2712; IV: 4113
general physiological factors, III: 2958
in binocular vision, II: 1211; IV: 4870
in monocular vision, II: 1211, 2115; IV: 4870
relation to depth perception, II: 1464, 1465; III: 2849, 3100; IV: 4227, 4228
role of eye movements, III: 2957
time factors, II: 1644
SKIN (see also Complexion; Cutaneous circulation; Cutaneous respiration; Sweat glands)
chapping, I: 365
effects of:
barometric pressure, I: 365
cosmic rays, III: 2581; IV: 3944, 4124
heat, I: 613
humidity, I: 365
thermal radiation, III: 2883, 3096
ultraviolet rays, III: 3095
vibration, II: 1649, 2089, 2090
electrical potentials see Galvanic skin response
metabolism
effects of cold, IV: 4050
temperature
effects of:
body fat, IV: 3769
chlorpromazine, IV: 3979
circulation, IV: 3822
cold, IV: 3769
perspiration, IV: 3822
water exchange (see also Perspiration), I: 691; II: 2161
SKULL
effects of vibration, III: 2754
SLEEP
relation to:
anoxia, II: 1325
blood oxygen tension, III: 3598
cerebral circulation, IV: 4606
diurnal cycle, III: 3012
electroencephalogram, III: 2855
SLEEP DEPRIVATION
effects on:
alertness, IV: 3954
cerebral circulation, IV: 4606
mental performance, IV: 3953, 3954
psychomotor performance, II: 1131; IV: 3954
reaction time, IV: 3954
general physiological effects, III: 3012
relation to fatigue, II: 1165, 1760
SMELL see Olfactory perception
SMOKING see Tobacco
SOCIAL DEPRIVATION see Human isolation
SOCIAL FACTORS see under Air crews, performance; Teams, behavior; Work capacity
SOCIETIES see under Aviation medicine
SODIUM AZIDE
effects on electrical potentials of cochlea, I: 839
SODIUM CHLORIDE (see also Chloride metabolism)
effects on heat tolerance, IV: 4487
SODIUM METABOLISM (see also Electrolyte distribution; see also entries under Sodium-potassium ratio)
effects of:
altitude, II: 2206
altitude acclimatization, II: 2206
anoxia, III: 2742
positive acceleration, IV: 3910
pressure breathing, IV: 4379
SODIUM POTASSIUM RATIO see under Brain
SODIUM THIOPENTAL see Barbituric acid derivatives
SOLAR RADIATION (see also Ultraviolet rays)
effects on:
circulation, II: 1546
digestive system function, I: 267; II: 1265
hazards, IV: 5169
SOLVENTS see Organic solvents
SOMATOTYPE (see also Body measurements), III: 3072

relation to physical fitness, IV: 4075

SOMATROPIN
effects on:
body weight, III: 3397
cold tolerance, IV: 4084

SOUND (see also After-sound; Auditory signals; Auditory stimuli; Noise)
cause of:
pain, II: 1453
tympanic muscle reflexes, IV: 5159
effects on:
auditory perception, II: 1540, 1541; III: 2886; IV: 4415
brain, IV: 4734
cochlea, II: 1284, 1287; IV: 3714
color vision, II: 1949
ear, II: 1453
electrical potentials of cochlea, I: 839; II: 1284, 1287; IV: 5070, 5157
hearing, III: 2364, 3404; IV: 3714
pulse rate, IV: 5201
tissues, III: 2762; IV: 5150
general physiological effects, II: 944
test methods, III: 3260
localization, II: 1114; III: 2536
effects of:
auditory stimuli, II: 995
visual stimuli, II: 995
tests, II: 1151, 2173

SOUNDPROOFING see Reduction under Airplane noise (Interior); Jet plane noise (Interior); Noise

SOVENTOL
use in motion sickness, II: 1509

SPACE CABINS
atmosphere see Space cabin atmospheres,
equipment, III: 3252

SPACE CABIN ATMOSPHERES, III: 3236
regeneration (see also entries under Gas exchangers), II: 1132
sanitary aspects, IV: 3875, 4296, 4297

SPACE ENVIRONMENT
general physiological effects, III: 2779
research, IV: 4740

SPACE FLIGHT (see also High altitude flight; Lunar expeditions; Rocket flight; Satellite flight)
general physiological effects, I: 120, 579, 813
hazards (see also Meteorites), I: 880
medical problems, I: 118, 138, 221, 435, 438, 439, 440, 441, 442, 447, 830; II: 2022; III: 2359, 2728, 2779, 2780, 3071, 3263, 3513; IV: 3886, 3899, 4118, 4327, 4427, 4428, 4441, 4508, 4554, 4558, 4740, 4878, 5014, 5028, 5151
animal experiments, I: 14, 70; II: 1712

SPACE FLIGHT FEEDING (see also Flight feeding), II: 1133

SPACE FLIGHT SIMULATORS, IV: 3729

SPACE MEDICINE, I: 811
congresses, meetings, and symposia, III: 3410
history, I: 811, 882; IV: 4600
research, I: 439, 445, 725; III: 2929

SPACE STATIONS
human engineering, I: 571

SPACE SUITS, I: 264; III: 3264; IV: 4727, 4756

SPAIN see under Ambulance planes

SPATIAL ORIENTATION (see also Topographical orientation)
bibliography, IV: 4608
disturbances
in piloting (see also Fascination), II: 1238; III: 2592; IV: 3884, 3973
effects of:
acceleration, I: 251, 408, 409, 900
advance information, II: 1789
anoxia, III: 2821; IV: 4831
illumination, I: 424, 425
intermittent light, III: 2415
light stimuli, I: 424
menstruation, II: 2038
noise, II: 952
posture, II: 2238; III: 2821
spinning, IV: 4915
subgravity, I: 14, 116, 369, 475, 830; II: 931, 1742; III: 2319, 2460, 2790; IV: 3806, 4211, 4960
tilting, II: 1402, 1404; III: 2594, 2595, 2596
training, IV: 5144
vestibular stimulation, III: 2975
visual displays, III: 2905
in high altitude flight, I: 220
in instrument flight, I: 36
in piloting, IV: 3973
psychological factors, I: 619
relation to:
form perception, IV: 3801
head movements, II: 1404; IV: 4501
sensory illusions, I: 36; III: 3339
role of:
labyrinth, I: 410, 411, 556, 903; II: 1079, 1482, 2166; III: 3035; IV: 3827, 5185
proprioception, I: 180, 617, 618, 619, 829, 872; III: 2594, 2595, 2596; IV: 5185
sensory perception, IV: 4472
visual perception, I: 180, 375, 376, 617, 618, 619, 716, 829; II: 2224, 2237; III: 2633; IV: 3827, 3905, 4222

sex factors, II: 2038; III: 2595

test methods, II: 982, 1235
analysis, III: 3689, 3690
SPEAKING (see also Jaw movements in speaking; Speech; Voice)
analysis, II: 2134
effects of:
microphones, III: 3557
side-tone, III: 2408, 3357
speech feedback, III: 2410, 3357; IV: 3850
effects on:
alveolar carbon dioxide tension, I: 455
auditory perception, IV: 3754
pitch discrimination, III: 2497
respiration, I: 171, 455
general physiological effects, IV: 4924
general physiological factors, I: 103, 171; II: 1002; III: 2408, 2495
SPECTACLES (Eyeglasses) (see also Sunglasses), I: 433; II: 1369; IV: 3800
SPEECH (see also Speaking; Voice)
disorders see Speech disorders
intelligibility (see also Listening performance), I: 104, 459, 552, 837; II: 1111, 1408, 1662, 1952; III: 2496, 2498, 3554; IV: 3852, 3853, 4924, 5066
effects of:
advance information, IV: 3851
airplane flight, IV: 4359
alertness, III: 2533
altitude, I: 104; III: 3248
auditory cues, IV: 4561
binaural hearing, IV: 3918
communication systems, IV: 4130
dental prostheses, II: 977
ear plugs, II: 1872
fatigue, II: 2232
noise, I: 551, 837; II: 1108, 1573, 1731, 1872, 2027, 2102, 2232, 2273; III: 2482, 2932, 3205, 3270; 3305, 3307, 3308, 3332, 3555, IV: 3838, 4100, 4483, 4776, 4777, 4797, 4810
practice, III: 2535
side-tone, II: 1001; III: 2409, 2411; IV: 4773, 4923, 4925, 5064
visual cues, IV: 4561
voice, IV: 4676
relation to deafness, III: 3305
test methods, II: 1109, 1436, 1610, 1688, 1703, 2134; III: 3556; IV: 3847, 4739
tests, II: 1220; IV: 4771, 4772, 4774, 4778, 5063, 5065
time factors, II: 1436
loudness, I: 710; III: 3557; IV: 3848
SPEECH COMMUNICATION
analysis, IV: 5062
SPEECH DISORDERS, II: 1610
SPEECH FEEDBACK
effects on speaking, III: 2410, 3357; IV: 3850
SPINAL COLUMN (see also Spine injuries)
examination, II: 1844
SPINAL CORD (see also Cerebrospinal fluid)
action potentials
effects of anoxia, IV: 4202
effects of anoxia, III: 3099
SPINE INJURIES, I: 75, 671; II: 1215
statistics, III: 2684
SPINNING (see also Tumbling)
effects on spatial orientation, IV: 4915
SPLEEN
effects of:
anoxia, IV: 4418
heat, III: 2561
high altitude flight, III: 2611, 2670, 3228
examination, III: 3396
metabolism
effects of anoxia, II: 1984, 1985
role in:
altitude tolerance, IV: 4034
anoxia tolerance, IV: 4344
SPORT ACTIVITIES
relation to physical fitness, I: 361; II: 1800, 1908, 2263; III: 2824, 2935, 3190, 3310
STANDING POTENTIAL
effects of:
anoxia, I: 217
hypercapnia, I: 217
STARVATION
effects on:
anoxia tolerance, II: 1873; III: 3251
auditory perception, II: 1663; IV: 3903
blood cells, III: 3030
circulation, III: 3030
lipid metabolism, IV: 3812
liver metabolism, IV: 4617
memory, II: 1663
metabolism, III: 3499, 3535
muscular strength, IV: 3903
protein metabolism, IV: 4381
psychomotor performance, II: 1663
reasoning, II: 1663
visual perception, II: 1663; IV: 3903
work capacity, II: 1663; III: 2915; IV: 3915

general physiological effects, II: 1663

general psychological effects, II: 1663

STASIS see Circulation

STEP TEST, IV: 4555

STEREOSCOPIC VISION see Depth perception

STERILITY see Fertility

STEROID EXCRETION

effects of:

cold acclimatization, IV: 4019

stress, IV: 4008

STEROID METABOLISM

effects of cold, IV: 4106

STEROIDS (see also Androsterone; Progesterone), III: 2569, 3415

chromatographic analysis, II: 1690

STIMULI see Auditory stimuli; Caloric stimuli; Electrical stimuli; Light stimuli; Nasal stimulation; Vestibular stimulation; Visual stimuli

STIPPLE TEST, III: 3667, 3670; IV: 5190

STOMACH see Gastric secretion

STRABISMUS see Heterophoria

STRAINING see Anti-g procedures

STRENGTH see Muscular strength

STRESS (see also Acceleration; Anoxia; Cold; Combat stress; Fatigue; Heat; Mental stress; Physical work; Restraint)

cause of:

anxiety, IV: 3791

fatigue, II: 1691

caused by airplane flight, III: 3043

effects on:

adrenal glands, II: 1462, 1691; III: 2417

ascorbic acid metabolism, IV: 4664

autonomic nervous activity rhythm, IV: 4242

blood cells, II: 1318, 1319, 1320, 1462, 1691

blood sugar, III: 2787; IV: 4572

circulation, III: 3029; IV: 4463

flicker fusion frequency, II: 1167; III: 2396, 2397

lipid metabolism, IV: 3813

performance of aviators, I: 33; II: 1113; IV: 5011

protein metabolism, III: 2586

psychomotor performance, I: 284; III: 2550

steroid excretion, IV: 4008

general physiological effects (see also General adaptation syndrome), II: 1200, 1828; IV: 3791

research, II: 1903

general psychological effects, IV: 3791

relation to neuroses, II: 1145

tolerance see Stress tolerance

STRESS SENSITIVITY (see also Stress tolerance)

bibliography, II: 1828

effects of cold, III: 3001

test methods, II: 1827, 1828

STRESS TOLERANCE (see also Stress sensitivity)

relation to:

age, II: 1145; III: 3026

neuroses, II: 1145

STRETCHERS, I: 467

evaluation, IV: 5016

SUBGRAVITY (see also Free fall)

cause of visual illusions, I: 369

effects on:

circulation, I: 475; II: 931, 1742; III: 2319

labyrinth, I: 475; II: 931; III: 2319; IV: 4964

mental performance, III: 2601

neuromuscular performance, I: 116; III: 2601; IV: 4960

oxygen consumption, II: 992

proprioception, IV: 4964

psychomotor performance, II: 992

sensory perception, II: 992; III: 2863

spatial orientation, I: 14, 116, 369, 475, 830; II: 931, 1742; III: 2319, 2460, 2790; IV: 3806, 4211, 4960

general physiological effects, I: 92, 475, 830, II: 931, 1446, 1515, 1638, 1742

test methods, II: 1798

general psychological effects, III: 2601; IV: 4705

research, I: 14, 70, 364, 437, 443; II: 1071

SUCCESS (see also items listed under Prediction of success)

relation to personality, IV: 4860

SUCCINATES

effects on:

circulation, II: 1281

respiration, II: 1281

SUCCINIC ACID METABOLISM

effects of cold, IV: 4050

SUGAR see Blood sugar

SUITS see Altitude suits; Anti-g suits; Exposure suits; Space suits; Ventilated suits

SULFHYDRYL METABOLISM

effects of:

hypothermia, III: 2452, 3361

restraint, III: 2452; 3361

tumbling, III: 2458; IV: 3802

SULFONAMIDE COMPOUNDS (see also Diamox)

effects on altitude tolerance, IV: 4683

toxic effects in anoxia, I: 275; III: 2628

use in otitis externa, II: 1535

SUNGLASSES, I: 219, 667
optical properties, II: 1572, 1586
SUNSHINE see Solar radiation
SUPERSONIC FLIGHT
effects on visual perception, I: 138, 770; IV: 4959
general psychological effects, I: 37
history, IV: 4087
medical problems, I: 37, 138, 173, 357, 770; III: 2570; IV: 4087
reaction time, IV: 4070
SUPERSONIC VIBRATIONS see Ultrasonic vibrations
SUPINE POSITION FLIGHT
effects on acceleration tolerance, I: 116; III: 2785
tests, II: 1440
SURFACE see Body surface
SURGEONS see Flight surgeons
SURGERY see Parabiosis; Plastic surgery
SURVIVAL, II: 1052, 1674; IV: 4208
effects of:
cold, IV: 4471
diet, III: 3016; IV: 4471
water deprivation, II: 1040; III: 3015, 3016
equipment, I: 47
handbooks and treatises, IV: 3952; 5102
in space, II: 1133, 1712
in the air (see also Bailout), I: 47; II: 1755, 2043
in the Arctic, I: 24, 47, 81; II: 1260, 1597; IV: 4589, 4867, 5054
in the Tropics, II: 1804
on land, I: 81, 739, 890; II: 1144, 1596, 2017, 2258; IV: 4133, 4307
equipment, IV: 3721
on water, I: 47, 81, 454, 739; II: 1040, 1366; III: 2879, 2910, 3578, 3644, 3682; IV: 3758, 4041, 4062, 4306, 4545, 5073
equipment, II: 925, 1181, 2016; IV: 4976
psychological factors, II: 1722, 2183, 2184; III: 3559, 3560; IV: 5071, 5072
training methods, IV: 4530
SURVIVAL RATIONS see Emergency rations
SURVIVAL TRAINING, IV: 4326
SUSPENSION see Life suspension
SWEAT
composition
effects of:
heat, III: 2343, 2892, 2911; IV: 4468
heat acclimatization, III: 2343
humidity, III: 2911
physical work, III: 2343, 2892
SWEAT GLANDS (see also Perspiration; Sweat)
fatigue, IV: 5052
SWEATING see Perspiration
SWEDEN see under Aviation medicine
SWITCHES
human engineering, I: 815
SWITZERLAND see under Aviation medicine; Pilots, selection; Pilots, training; Psychomotor performance, research
SYMPATHETIC NERVOUS SYSTEM see Autonomic nervous system
SYMPOSIA see Congresses, meetings, and symposia
SYNCOPE see Fainting
TACTILE DISCRIMINATION, IV: 4094
TACTILE PERCEPTION, I: 154
effects of:
cold, I: 119; II: 1765; III: 3142; IV: 4592
cold acclimatization, IV: 4592
noise, II: 1532
test methods, III: 3536
use for communication, IV: 4201
TACTILE SIGNALS
use in piloting, IV: 4348
TALUS INJURIES see Leg injuries
TARGET IDENTIFICATION, I: 193, 372; II: 1025, 1158, 1864; III: 2713; IV: 4114, 4213
tests, II: 1364; III: 2384, 2385; IV: 4212
TARGET PRACTICE (see also Aerial gunnery)
tests, III: 2644; IV: 4111
TARGET TRACKING (see also Compensatory tracking; Pursuit tracking; Rotary pursuit tracking) I: 775, 780; II: 984, 1448, 1485, 1548, 1631, 1726, 1727, 1733, 2080, 2109, 2156; III: 2468, 2484, 3336; IV: 3796, 4210, 4268, 4318, 4446, 4763
physical factors, IV: 5128
training devices, II: 1911
human engineering, II: 1732
TARGETS
identification see Target identification
visibility, I: 346; II: 1442, 1552, 1751
TASK COMPLEXITY
effects on:
reaction time, II: 1290
TEAMS (see also Air crews; Rescue medical teams)
behavior
social factors, IV: 4385
morale
effects of leadership, IV: 4943
performance
effects of leadership, IV: 4943
prediction of success, IV: 4548

TECHNICIANS see Electronics technicians

TEETH (see also Dental anomalies; Dental care; Dental disturbances; Dental examination; Dental prostheses; Tooth fillings)
effects of airplane flight, IV: 4429

TELEGRAPH OPERATION, II: 1920

TELEMETRY see Physiological telemetry

TELEPHONE see Earphones

TELESCOPES see Instrumental magnification

TEMPERATURE see Body temperature; Environmental temperature, and Temperature under Blood, Cabins, Lung. Also see Caloric stimuli, Thermal radiation

TEMPERATURE CONTROL see under Cabins

TEMPERATURE REGULATION (see also Heat loss), II: 1565; IV: 3940, 5045, 5051
analysis, III: 2882; IV: 4314
animal experiments, III: 2882; IV: 4314
effects of:
altitude, I: 345
altitude acclimatization, II: 1411; III: 3179
anoxia, I: 194, 195, 468
barbituric acid derivatives, IV: 5044
chlorpromazine, IV: 4029, 5044
clothing, IV: 4079
cold, IV: 4027
cold acclimatization, III: 2439, 2440, 2920; IV: 3779, 3930, 4482
drugs, III: 2434; IV: 3887
environmental temperature, II: 1204; III: 2669
heat acclimatization, III: 2457
hypothermia, III: 2897; IV: 4448
restraint, III: 2450, 2451, 2920
general physiological factors, III: 2882, 2897, 3481; IV: 4314
in hibernators, IV: 4400
race factors, IV: 4635
relation to:
body temperature, IV: 4219
muscular function, IV: 4871
oxygen consumption, III: 2679; IV: 3788
perspiration, IV: 4454
thermoreception, III: 2916; IV: 4036
reviews, IV: 4449, 4819
role of:
adrenal glands, IV: 3946, 4564
body fat, IV: 3769
endocrine system, I: 345
nervous system activity, IV: 3946, 4036
shivering, IV: 4028
thyroid gland, IV: 4170

TENSION see entries under Carbon dioxide tension; Oxygen tension

TERRAMYCIN
use in otitis externa, II: 1535

TESTIS
effects of mental stress, IV: 4407

TESTS see Achievement tests; Apnea test; Aptitude tests; Cold pressure test; Flack test; Personality tests; Psychological testing; Step test; Stipple test; Written tests. Also see Tests and Test methods under objects and conditions tested, e.g., Color vision, tests; Hearing, test methods

TETRAETHYL AMMONIUM AND DERIVATIVES
effects on:
digestive system function, II: 1386
hyperoxia tolerance, IV: 4282

TETRAETHYL PYROPHOSPHATE
effects on altitude tolerance, I: 122
toxic effects, I: 817

THAILAND see under Aviation medicine

THEPHORINE
use in motion sickness, I: 156

THERMAL RADIATION (see also Caloric stimuli)
effects on skin, III: 2883, 3096
protection, III: 3151

THERMORECEPTION
relation to temperature regulation, III: 2916; IV: 4036
reviews, III: 2916

THERMORECEPTORS
physiology, II: 1565; III: 2916; IV: 5203

THIAMINE
effects on altitude tolerance, I: 349

THIOPENTAL SODIUM see Barbituric acid derivatives

THIRST see Water deprivation

THROMBOCYTES (see also Blood coagulation)
effects of:
anoxia, IV: 4465
physical work, IV: 4967
posture, IV: 4967

THYMUS
role in anoxia, I: 491; III: 2936

THYROID GLAND
effects of:
cold, III: 2645, 2646; IV: 4038, 4049, 4197, 4443, 5007
thyrotropin, IV: 4197
metabolism
effects of heat acclimatization, IV: 3986
role in:
altitude acclimatization, I: 866
ascorbic acid metabolism, III: 3193
cold acclimatization, IV: 4048
heat tolerance, III: 2435

hibernation, III: 2646

temperature regulation, IV: 4170

THYROTROPIN

effects on thyroid gland, IV: 4197

TILTING (see also Postural change)

cause of eye movements, II: 1768, 1769

effects on:

acceleration tolerance, III: 2785

circulation, III: 2716, 2784

spatial orientation, II: 1402, 1404; III: 2594, 2595, 2596

TIME ESTIMATION

effects of noise, IV: 4417, 4970

effects on biological rhythms, IV: 4105

TIME RESERVE, I: 436, 450, 587; II: 2043, 2137; III: 3127, 3500

effects of polycythemia, IV: 4622

TISSUE FLUIDS

distribution

effects of anoxia, II: 1718

TISSUE PRESSURE

effects of:

explosive decompression, I: 530; II: 1654

pressure breathing, IV: 4117

TISSUE TRAUMA

effects on lipid metabolism, II: 1992, 1993; III: 3201, 3202, 3203, 3359

relation to pain, III: 3095

TISSUES (see also Bone; Bone marrow; Muscle tissue; Myocardiac tissue)

carbon dioxide tension

effects of hyperoxia, II: 1698

composition

effects of altitude, I: 278

effects of:

sound, III: 2762; IV: 5150

vibration, I: 377

gas bubble formation, IV: 4362, 5112

metabolism

effects of:

altitude, III: 2467

altitude acclimatization, II: 1241; III: 2593

cold, IV: 4410

cold acclimatization, II: 1241; III: 2593

heat, IV: 4410

oxygen tension, IV: 4906

measurement, IV: 4906

physical properties, II: 1649

thermal properties, III: 3096

trauma see Tissue trauma

TOBACCO (Smoking) (see also Nicotine)

effects on:

electrocardiogram, III: 2344

physical fitness, I: 322

visual perception, I: 339

role in carbon monoxide poisoning, III: 2740

TOCOPHEROL see Vitamin E

TOILETS see entries under Sanitary facilities

TOLERANCE see Acceleration tolerance; Altitude t.; Anoxia t.; Carbon dioxide t.; Carbon monoxide t.; Cold t.; Explosive decompression t.; Heat t.; Hyperoxia t.; Hypothermia t.; Impact t.; Noise t.; Nuclear radiation t.; Stress t.; Tumbling t.; Vibration t.; Wind t.; X-ray t. Also see Tolerance under Acceleration (Negative); Acceleration (Positive); Acceleration (Transversal); Cosmic rays; Jet plane noise; Rotation

TONUS see Muscular tonus

TOOTH FILLINGS, I: 481

TOOTHACHE see Dental disturbances

TOPOGRAPHICAL ORIENTATION, I: 252, 254; IV: 3972

physical factors, IV: 4944

TOUCH see Tactile perception

TOXIC EFFECTS see under Aircraft brighteners; Carbon tetrachloride; Deodorants; Engine oils; Fire extinguishing agents; Gasoline; Hydraulic fluid; Hydrazine; Hydrogen peroxide; Jet fuels; Kerosene; Lubricants; Methyl bromide; Morphine; Organic solvents; Ozone; Rocket propellants; Sulfonamide compounds; Tetraethyl pyrophosphate; Tricresyl-phosphate. Also see Poisonous substances

TRACKING see Compensatory tracking; Pursuit t.; Rotary pursuit t.; Target t.

TRAFFIC CONTROL OPERATION

effectiveness, III: 3177

fatigue, III: 3460

TRAFFIC CONTROL OPERATORS

attitudes, II: 1823; III: 3304

performance, III: 3304, 3460; IV: 3983

selection, I: 74; III: 2816

training, III: 2346, 2347; IV: 4354, 4619

TRAFFIC CONTROL SYSTEMS, IV: 4045

human engineering, II: 1248, 2152; IV: 4423

TRAINEES (see also Pilot candidates)

attitudes, II: 1018, 1019, 1020, 1021, 1022, 1023, 1394, 1587, 1588, 1590, 1671, 2188; III: 2421, 2433; IV: 3874, 4502

classification, IV: 4729

motivation, IV: 5088

personality, III: 2444, 2944; IV: 3717

tests, IV: 4184

rating, IV: 5136, 5138

selection, III: 2574, 3102, 3321; IV: 4697, 4805

training, III: 2423

TRAINING (see also Adjustment to training; Learning; Parachute training; Practice; Survival training; Trainees; Verbal pretraining; see also Training under the various personnel categories, e.g., Pilots, training; see also items under Retention of training, Training methods, and Transfer of training)
effects on:
depth perception, IV: 4221
dynamic visual acuity, III: 3126; IV: 4565
peripheral vision, IV: 3963
psychomotor performance, IV: 4603
reaction time, III: 3163
recognition of moving objects, IV: 3833
spatial orientation, IV: 5144
general psychological effects, III: 3568
handbooks and treatises, II: 1832
relation to mental ability, III: 3548
role of physical work, I: 335
time factors, IV: 3732, 4725

TRAINING DEVICES (see also under Aerial gunnery; Aircraft landings; Bailout; Instrument flight; Jet plane piloting; Navigation; Night vision; Piloting; Pursuit tracking; Radar operation; Rotary pursuit tracking; Target tracking; see also Flight simulators; Motion pictures as training devices; see also Use of motion pictures under Pilots, training)
effectiveness, IV: 4689
human engineering, II: 1831, 1834

TRAINING METHODS see under Bailout; High altitude flight; Instrument flight; Night flying; Night vision; Survival

TRAINING OFFICERS (see also Instructors)
duties, IV: 4161

TRAINING PLANES, IV: 4651

TRANSFER OF INFORMATION (see also Messages), I: 711, 712, 713, 714; II: 1397, 2152

TRANSFER OF TRAINING see under Compensatory tracking; Mental performance; Peripheral vision; Psychomotor performance

TRANSFUSION see Blood transfusion

TRANSPORTABILITY OF PATIENTS see Air transportation of patients

TRANSPORTATION see Air transportation of patients; Medical personnel, air transportation; Passenger transportation; Stretchers

TRANSVERSAL ACCELERATION see Acceleration (Transversal)

TRAUMA see Injuries

TREMOR see Eye tremor; Finger tremor

TRICRESYLPHOSPHATE
toxic effects, I: 525

TRIMETON
use in motion sickness, I: 231, 233, 235, 236; II: 1226

TROPICS see Survival in the tropics

TUBA AUDITIVA see Middle ear

TUBERCULOSIS, IV: 4665
incidence in aviators, IV: 4131

TUMBLING (see also Spinning)
effects on:
circulation, IV: 4095
electrocardiogram, IV: 5149
sulfhydryl metabolism, III: 2458; IV: 3802
general physiological effects, I: 323

TUMBLING TOLERANCE
effects of heat, II: 1889

TURBOJET ENGINES
hazards, II: 1119, 1376, 1786; III: 2517; IV: 4682

TYMPANIC CAVITY see Middle ear

TYMPANIC MUSCLE REFLEXES
caused by sound, IV: 5159

TYMPANIC MUSCLES
physiology, IV: 5156

TYPE see Somatotype

U.S.A. see United States

ULCERS see Peptic ulcer

ULTRAHIGH FREQUENCY RADIATION see Microwave radiation

ULTRASONIC VIBRATIONS
effects on:
blood cells, I: 417; II: 1171, 1172, 1498; III: 2829
bone, II: 1865
brain, II: 1566, 1865; III: 2829
central nervous system, III: 2761
circulation, II: 1884; III: 2829
cochlea, IV: 3737
ear, II: 1865
electromyogram, III: 2762
endocrine system, II: 1174
eye, II: 1706
hearing, II: 1304; III: 2663
nerves, II: 1807
general physiological effects, I: 416, 687, 688; II: 1127, 2198, 2211; III: 2552, 2711, 2846, 3629; IV: 3982
test methods, III: 3260
tests, III: 2526
pathological effects, II: 1173

ULTRAVIOLET RAYS
effects on:
dark adaptation, II: 1900; IV: 5182
skin, III: 3095
general physiological effects, I: 216; II: 1841

hazards, III: 2443
relation to visual perception, II: 1900, 2221
UNCONSCIOUSNESS see Blackout; Fainting
UNITED STATES see under Aviation medicine; Military medicine
UPPER ATMOSPHERE
microorganisms, III: 2767, 2768, 3550
research, I: 649; II: 2104; III: 2865; IV: 4740, 5105
research methods, III: 2868
URINARY SYSTEM see Kidney
URINE
composition
effects of:
acceleration, II: 1881
altitude acclimatization, II: 974; III: 3415, 3569
anoxia, II: 974; IV: 4980, 4981, 4982
cold, III: 2959; IV: 4443
environmental temperature, IV: 5197
heat, III: 2569, 2906, 2989; IV: 4440
physical work, III: 2722, 3229
posture, IV: 3935
sensory deprivation, IV: 4690
disposal, III: 3146
pH
effects of hyperventilation, III: 3137
UROGENITAL SYSTEM see Kidney; Reproductive system
USEFUL CONSCIOUSNESS see Time reserve
UTERUS
effects of anoxia, I: 859
VALSALVA MANEUVER (see also Anti-g procedures)
effects on:
blood pressure, II:1106, 1965
electrocardiogram, II:1210
middle ear, II:1702
VASOCONSTRICTOR EFFECTS see under Atropine; Ephedrine
VASOPRESSIN (Pitressin)
effects on:
anoxia tolerance, I:608
circulation, I:608
electrocardiogram, IV:3699
VELOCITY DISCRIMINATION (see also Motion perception)
effects of light stimuli, III:2548
physical factors, IV:3901, 3902, 4518
test methods, II:1163
tests, II:1472, 1473; III:2547; IV:4047, 4637
time factors, IV:3902, 4518
VENOUS PRESSURE see Blood pressure
VENTILATED SUITS, IV:4132, 4626, 4627
VENTILATION see under Cabins
VENUS (Planet)
life conditions, I:810
VERATRINE
effects on muscular function, II:1490
VERBAL PRETRAINING
effects on psychomotor performance, II:1764
VERNIER ACUITY, II:1714; IV:4523
VERONAL see Barbituric acid derivatives
VERTEBRAE see Spinal column
VERTIGO see Spatial orientation, disturbances
VESSELS see Blood vessels
VESTIBULAR AREA see under Cerebral cortex
VESTIBULAR STIMULATION (see also Rotation)
cause of nystagmus, IV:3785
effects on:
blood plasmalogen content, IV:4644
blood sugar, IV:4900
brain activity, II:1669
electrocardiogram, III:3488
electroencephalogram, II:2299; III:3687
galvanic skin response, IV:3811, 4818
spatial orientation, III:2975
visual accommodation, III:2993
general physiological effects, IV:3744
VESTIBULE see Labyrinth
VETERINARIANS
duties, IV:5118
VIBRATION (see also Bone conduction; Sound; Ultrasonic vibrations)
effects on:
bone, II:2089, 2090
circulation, I:450; II:1505, 1506
endocrine system, II:1176
finger tremor, IV:4551
neuromuscular performance, III:3105
patellar reflex, III:3405
skin, II:1649, 2089, 2090
skull, III:2754
tissues, I:377
visual acuity, III:3105; IV:4551
visual perception, III:3405
general physiological effects, I:206, 377, 379, 384, 385, 679; II:1175, 1176; III:2847, 3065, 3105; IV:3982, 4175
research methods, IV:4177
reviews, III:2552
pathological effects, IV:4175
reduction, II:1735; IV:4752
tolerance see Vibration tolerance
VIBRATION TOLERANCE, IV:4217
test methods, II:1934

VIGILANCE (see also Alertness), IV:4033
effects of:
climate, II.1922
environmental temperature, II:1922
noise, III:2537
practice, III:2537
effects on:
psychomotor performance, III:2853
reaction time, III:3539
fatigue, I:352; II:2255, 2256; III:2532; IV:3767
psychological factors, I:188; II:1024
relation to conditioned reflexes, I:188
VIRUSES see Influenza A virus
VISIBILITY see under Colors; Signal lights; Signal lights (Flashing); Targets
VISION (see also Binocular vision; Color vision; Eye; Foveal vision; Monocular vision; Peripheral vision; Retinal adaptation; Visual accommodation; Visual acuity; Visual field; Visual perception)
disturbances, II:1870
test methods (see also Refractometry), I:20, 94, 136, 152, 289; II:2170; IV:4188
VISORS
optical properties, II:1460
VISUAL ACCOMMODATION (see also Emmetropia; Night myopia)
effects of:
altitude, IV:3904
empty visual field, IV:4351
quinine, II:1245
vestibular stimulation, III:2993
visual cues, III:3636, 3638
relation to:
age, I:258
mental ability, I:258
night vision, II:1680
test methods, III:3637
tests, I:885
VISUAL ACUITY (see also Dynamic visual acuity; Vernier acuity)
effects of:
auditory stimuli, IV:4884
illumination, I:514; II:2298; IV:3825, 4069
instrumental magnification, III:3007
noise, IV:4551
optical filters, I:894
vibration, III:3105; IV:4551
in binocular vision, III:3257
relation to:
age, II:2298
color vision, II:1893
dark adaptation, I:294; II:1157; III:2660; IV:4055
depth perception, III:2979; IV:5047
eye tremor, II:1987; III:3368
night vision, IV:4731
personality, IV:4046
pupil size, III:2340
retinal adaptation, III:2340, 2546
test methods, II:1067, 1468, 2201; III:2815, 3174; IV:4069, 4653
tests, II:1123, 1310, 1714; III:3125; IV:3722
time factors, I:514
VISUAL CUES
effects on:
depth perception, III:2579
psychomotor performance, III:2778; IV:4223, 4342, 4475
speech intelligibility, IV:4561
visual accommodation, III:3636, 3638
use in:
aircraft landings, IV:4224
piloting, IV:4223
VISUAL DISPLAYS (see also Charts; Printed words), II:1994
effects on spatial orientation, III:2905
interpretation, II:1027, 1363, 1484; III:3111, 3112, 3113; IV:3876, 4153, 4293
effects of visual noise, IV:4812
motion estimation, IV:3873
position estimation, IV:3755
relation to control levers, III:2523; IV:4267
use in piloting, III:2739, 2950, 3387
VISUAL FATIGUE, I:201; II:1049; III:2466, 2470
VISUAL FIELD (see also Empty visual field; Field of vision under Airplane flight; Prone position flight)
measurement, II:1005, 1006; IV:3766
VISUAL FLIGHT, I:325; II:2176
learning, IV: 4855
VISUAL ILLUSIONS (Autokinetic phenomenon, Oculogravic illusion, Oculogyral illusion, Optical illusions) (see also Phosphenes), I: 410, 572, 716, 759, 783; II: 1482, 1585, 1614; III: 2700, 2905, 3123, 3195, 3384; IV: 4066
cause of accidents, II:1251; III:3422
caused by:
acceleration, I: 251, 408, 409, 410; IV: 3884
rotation, I: 99, 253, 407, 424, 425, 616, 620; II: 1500, 1501, 1502, 1529, 1877; III: 2840, 2851, 2931
subgravity, I:369
effects of:
auditory stimuli, II: 2119
illumination, II: 2014
in color vision, IV: 4741
in piloting, IV: 4501
relation to fatigue, II: 1759
VISUAL NOISE
effects on interpretation of visual displays, IV:4812

VISUAL PERCEPTION (see also Brightness discrimination; Contour perception; Depth perception; Flicker fusion frequency; Form perception; Motion perception; Pattern discrimination; Size perception; Velocity discrimination; Visual fatigue; Visual illusions; see also subdivision Visual requirements), I:20, 246
bibliography, I: 877
depth of focus, II: 1196; III: 2565
effects of:
anoxia, I: 192, 312, 339; II: 1088, 1089, 1393, 1941; III: 3414
anxiety, III: 3470
atomic explosions, I: 886
carbon dioxide, II: 1393
contact lenses, I: 314
drugs
alcohol, I: 242, 339
dimenhydrinate, II: 1389
epinephrine, II: 1393
nicotine, II: 1393
nicotinic acid, I: 192
nitrites, I: 192; II: 1393
fatigue, II: 1293, 1759, 1760; III: 3132
glare, I: 886; III: 3440
high altitude flight, II: 1188, 1189; IV: 4582
high speed flight, II: 1188, 1189; III: 2795
hyperoxia, II: 1088, 1393, 1941
illumination, I: 201, 276, 760; IV: 4998
intermittent light, II: 1443; III: 3454
time factors, III: 2791, 2792
retinal adaptation, IV: 4998
retinal image position, III: 3602
starvation, II: 1663; IV: 3903
supersonic flight, I: 138, 770; IV: 4959
tobacco, I: 339
vibration, III: 3405
fatigue see Visual fatigue
general physiological factors, II: 1161; III: 2912; IV: 4339
in radar operation, I: 183
of moving objects, IV: 4566
physical factors, II: 1006; III: 2340, 2713, 2807, 2808; IV: 4114
psychological factors, I: 110, 354; II: 1014, 1161; III: 2912; IV: 4339
relation to:
electroretinogram, IV: 4854
eye movements, III: 3124
pain, III:2788
retinal adaptation, I: 197; II: 1030, 1126, 1136; III: 2895
ultraviolet rays, II: 1900, 2221
research, II: 1449; IV: 4458
role in:
navigation, III: 2399
spatial orientation, I: 180, 375, 376, 617, 618, 619, 716, 829; II: 2224, 2237; III: 2633; IV: 3827, 3905, 4222
role of ocular dominance, III: 3602
test methods, I: 340; II: 1235, 1312
tests, II: 1314, 2251
thresholds, II: 1030, 1104, 1124, 1125, 1136, 1157, 2014; III: 3367
effects of vitamin A, II: 1927
relation to age, II: 1926
time factors, IV: 5153
time factors, II: 1159, 1217, 1218, 1615, 1994; III: 3367; IV: 4070
measurement, II: 1217, 1869
VISUAL PROBLEMS see under High altitude flight; High speed flight
VISUAL PURPLE see Rhodopsin
VISUAL REQUIREMENTS see under Aviators: Pilots
VISUAL SEARCHING (see also Aerial searching), III: 2426, 2714; IV: 4115
effectiveness, II: 1363, 1484, 1994
effects on electromyogram, II: 2044
tests, II: 1291; IV: 4412
VISUAL SIGNALS (see also Signal lights: Warning devices (Optical))
effects on:
psychomotor performance, IV: 4844
reaction time, I: 793; II: 1613, 1862, 2123; III: 2446
intelligibility, II: 1178
effects of auditory stimuli, II: 1856
interpretation, II: 1673, 1888; III: 3362
use in airports, III: 2675
VISUAL STIMULI (see also Empty visual field; Light stimuli; Visual cues; Visual noise)
cause of nystagmus, IV: 3864
effects on:
depth perception, II: 1452
intelligibility of auditory signals, II: 1856
psychomotor performance, III: 2842
reaction time, III: 2842
size perception, III: 2712; IV: 4113
sound localization, II: 995
general physiological effects, IV: 4026
localization, IV: 3905, 4519, 4520
VITAL CAPACITY
effects of hyperventilation, III: 3527
VITAMIN A (see also Xanthophyll)
effects on:
dark adaptation, II: 1458
visual thresholds, II: 1927

VITAMIN B COMPLEX (see also Nicotinic acid; Pyridoxine; Thiamine)
effects on:
cold tolerance, III: 3351
heat tolerance, III: 3014
VITAMIN B_1 see Thiamine
VITAMIN B_6 see Pyridoxine
VITAMIN B_c CONJUGATE see Folic acid
VITAMIN C see Ascorbic acid
VITAMIN E (Tocopherol)
effects on:
altitude tolerance, III: 3411, 3541
anoxia tolerance, III: 2469, 2817, 2818, 2819
electrocardiogram, III: 2818
hyperoxia tolerance, II: 2162; IV: 5046
pulse rate, III: 2819
VITAMIN P see Hesperidin
VITAMIN REQUIREMENTS (see also items under individual vitamins), III: 3208, 3211
VITREOUS HUMOR
effects of retinal adaptation, IV: 4952
VOCATIONAL INTEREST, III: 3291, 3376, 3392
in aviators, II: 1022, 1028, 1029, 2026, 2181
VOICE
effects on speech intelligibility, IV: 4676
VOICE IDENTIFICATION, II: 1952
VOLUNTARY APNEA see Apnea (Voluntary)
VOMEX A
use in motion sickness, I: 745
VOMITING CENTER
effects of narcotics, III: 3038
WAKEFULNESS see Sleep deprivation; Vigilance
WARNING DEVICES
for anoxia, I: 217, 450; III: 2373; IV: 3773, 4647
for hypercapnia, I: 217
WARNING DEVICES (ACOUSTICAL), II: 2123
WARNING DEVICES (OPTICAL), I: 793; II: 2123; III: 2426
for anoxia, I: 545
human engineering, III: 3585
WATER see Rescue on water; Survival on water
WATER DEPRIVATION (see also Dehydration)
effects on survival, II: 1040; III: 3015, 3016
general physiological effects, IV: 4524
WATER EXCHANGE (see also Water deprivation; Water intake), IV: 4174
effects of:
altitude, II: 1938, 2206
altitude acclimatization, II: 1938, 2206; III: 3478
heat, III: 2341, 3330; IV: 4440
hyperventilation, IV: 4016
in hot climates, III: 3000; IV: 4525
relation to diurnal cycle, III: 3194
through skin, I: 691; II: 2161
WATER INTAKE (see also Sea water intake)
effects of diet, II: 1674
effects on:
heat tolerance, IV: 4487
perspiration, III: 2709; IV: 4435
WATER SUPPLY
sanitary aspects, I: 888; IV: 4916
WEATHER (see also Environmental temperature; Humidity; Wind)
effects on:
circulation, I: 290; II: 1776
perspiration, IV: 4580
general physiological effects, IV: 3751
WEATHER OBSERVERS
training, III: 2355
WEIGHT (see also Body weight), I: 443, 444
WEIGHTLESSNESS see Subgravity
WHOOPING COUGH (Pertussis)
effects of airplane flight, I: 769, 876; IV: 4316
WIND
general psychological effects, I: 135
WIND BLAST
protection, IV: 4648
WIND BLAST TOLERANCE, I: 752; IV: 4999
WINDSHIELDS
human engineering, III: 2543, 2544, 2631, 3067; IV: 4231
WINTER see Parachute jumping in winter
WOMEN see Instructors (Female); Sex factors
WORDS see Printed words
WORK see Mental work; Physical work
WORK CAPACITY
effects of:
alcohol, III: 3220
altitude, III: 3604
altitude acclimatization, III: 2874, 3604
anoxia, II: 1032; III: 3109
blood loss, II: 1032; III: 2874
cold, III: 3220
diet, III: 2901
fatigue, III: 2431, 2432
heat, III: 3220, 3256
oxygen breathing, II: 1034; III: 2437, 3204; IV: 4685
rest, II: 1092, 1094, 1096; III: 2485, 3220, 3231
starvation, II: 1663; III: 2915; IV: 3915
measurement, III: 2432, 3626

relation to:
age, III: 2613
diurnal cycle, III: 2530
respiration, III: 3286
social factors, III: 3209
WORK DECREMENT see Fatigue
WORK LOAD
effects on rest requirements, IV: 3840
WORLD WAR II see under Air transportation of patients; Aviation casualties; Aviation medicine, history
WOUNDED see Patients
WOUNDS see Injuries
WRITTEN TESTS
intelligibility, II: 1738; III: 3104
XANTHOPHYLL AND DERIVATIVES
effects on retinal adaptation, III: 3518
X-RAY TOLERANCE
effects of:
altitude, I: 791; II: 2117
anoxia, II: 1913; III: 3352
carbon monoxide, IV: 4476
heat, I: 686; IV: 4077
hypothermia, I: 535, 537; II: 2141
X-RAYS (see also Roentgenography)
effects on:
altitude tolerance, I: 536; IV: 4477
anoxia tolerance, I: 536; II: 1668, 1873; III: 3251
brightness discrimination, II: 1431
hyperoxia tolerance, III: 2797
muscular system, I: 373
general physiological effects, III: 3024
general psychological effects, II: 1639
hazards, I: 216
tolerance see X-ray tolerance
ZERO ACCELERATION see Subgravity

CORPORATE AUTHOR INDEX

AEROJET ENGINEERING CORP., I:465

AGARD see NORTH ATLANTIC TREATY ORGANIZATION, Advisory Group for Aeronautical Research and Development

ALBANY MEDICAL COLL., III:2989

AMERICAN ELECTRONICS LABS., III:2373

AMERICAN INST. FOR RESEARCH, I:328, 329, 550, 624; II:1298, 1398, 1831, 1832, 1833, 1834, 2214; III:2867, 3207; IV:3728

ANDEAN INST. OF BIOLOGY (LIMA, PERU), IV:5053

ANTIOCH COLL., I:259, 342, 775, 776, 780; II:1232, 1279, 1280, 2081; III:2925, 3453, 3472; IV:4417, 4939

ARKANSAS, UNIV., I:831; II: 2002, 2168

BOEING AIRPLANE CO., I:892

BOLT, BERANEK, AND NEWMAN, I:176; II:2028; IV:3860, 4632

BOSTON UNIV., I:120; II:1864, 2009; III:2887; IV: 4329

BROOKLYN COLL., II:966, 967

BROWN UNIV., III:3368; IV:3944

BRYN MAWR COLL., I:148, 149, 150; IV:3830, 3831

BUFFALO, UNIV., II:1178; III:2555

CALIFORNIA, UNIV., I:429, 836; II:1562, 2161; III:2501, 2913, 2954, 3046, 3159; IV:3793, 4385, 4580

Inst. of Transportation and Traffic Engineering, II:1113, 1170, 1230, 1516, 1638, 1735, 1740, 1762, 1806, 1848, 2021, 2084, 2172, 2226, 2289

CANADA. DEFENCE RESEARCH BOARD, I:295, 518; III:3563; IV: 3967, 4023, 4241

CANADA. DEFENCE RESEARCH MEDICAL LABS., I:415, 668; II:1749; III:2392, 3248; IV:3967, 4931

CANADA. DEPARTMENT OF TRANSPORT, IV:4110

CANADA. INST. OF AVIATION MEDICINE, I:772, 773; II:1748; III:3180, 3517, 3563; IV:4628

CARNEGIE INST. OF TECHNOLOGY, II:1361

CATHOLIC UNIV., III:2526

CENTRAL INST. FOR THE DEAF, II:1284; III:2932; IV:4109

CHICAGO, UNIV., I:338; II:952, 1222, 1285, 1286, 1453, 1454, 1532, 1823, 1871, 1872, 2040, 2225

CINCINNATI, UNIV., III:3564

COLORADO, UNIV., III:3635

COLUMBIA UNIV., I:197, 198, 199, 294, 380, 480, 832, 833; II:1479, 1480, 1904, 2169; III:2340, 2922, 3441, 3603; IV:3988, 5057

CONNECTICUT COLL., III:2383; IV:3741, 4660

CONNECTICUT, UNIV., IV:3883, 5142, 5201

CONSULTANTS AND DESIGNERS, INC., IV:4504

CORNELL UNIV., I:374; II:1449; IV:4222

Crash Injury Research, I:273, 274, 286, 287; II:1295, 1296, 1544; III: 2894

Daniel and Florence Guggenheim Aviation Safety Center, II:1503

Dept. of Public Health and Preventive Medicine, I:466

DOUGLAS AIRCRAFT CO., I:633; III:3483; IV:4088

DUKE UNIV., II:1522, 1570, 2060, 2061, 2096; III:2873; IV:4349

DUNLAP AND ASSOCIATES, INC., II:1247, 1248, 1324; IV:4088

DURHAM, UNIV. (GT. BRITAIN), IV:4563

EDUCATIONAL RESEARCH CORP., I:834

EDUCATIONAL TESTING SERVICE, I:272

EMORY UNIV., I:305; III:3198, 3200

ENGINEERING CLINIC, IV:3911

FLORIDA STATE BOARD OF HEALTH
Bureau of Laboratories, II:1535, 2288

FLORIDA STATE UNIV., IV:3768

FORDHAM UNIV., I:91; III:2378

FOSTER D. SNELL, INC., I:366, 367

FRANKLIN INST., I:548, 549; III:3034; IV:4808

GEORGE WASHINGTON UNIV., I:236; II:1394, 1842; IV:4208, 4306, 4307, 4664, 5072

GOODYEAR AIRCRAFT CORP., IV:4235

GT. BRIT. AERONAUTICAL RESEARCH COUNCIL Engineering Physics Subcommittee, II:954, 1076, 1103, 1569, 1997, 2136

GT. BRIT. APPLIED PSYCHOLOGY RESEARCH UNIT, I:188, 352; II:1148, 1151, 1256, 1257, 1258

GT. BRIT. CHEMICAL DEFENSE EXPERIMENTAL ESTABLISHMENT, IV: 5163

GT. BRIT. COLL. OF AERONAUTICS

GT. BRIT. FLYING PERSONNEL RESEARCH COMMITTEE. I: 119, 183, 184, 189, 269, 270, 296, 656, 657, 793, 886; II: 978, 1047, 1049, 1128, 1166, 1186, 1195, 1269, 1288, 1289, 1290, 1293, 1301, 1568, 1747, 1778, 1989, 2123, 2251, 2257; III: 2530, 2531, 2664, 2665, 2848, 3118, 3338, 3460, 3638; IV: 3890, 4057, 4116, 4117, 4180, 4359, 4379, 4563, 4945, 4946, 4948, 4980, 4981, 4982, 5166

GT. BRIT. MEDICAL RESEARCH COUNCIL, II:1352, 1448, 1567, 1720, 1918, 1919, 1920, 1921, 1922, 1958, 1959, 1960, 1961; III:2533, 2534, 2535, 2635, 2803, 3337, 3456; IV:3890, 4591, 4975

GT. BRIT. NAVAL MOTION STUDY UNIT, II:1862, 1863

GT. BRIT. RAF INST. OF AVIATION MEDICINE, I:655, 793; III:3485, 3636, 3637; IV:4117, 4180, 4379, 4945, 4980, 4981, 4982

GT. BRIT. ROYAL AIRCRAFT ESTABLISHMENT, I:132, 133, 534, 655, 764; III:3119; IV:5174

GT. BRIT. ROYAL NAVAL PERSONNEL RESEARCH COMMITTEE, IV:3758

HARVARD UNIV., I:134, 343, 344, 488, 709, 721, 722, 743, 864, 918; II:1560, 1969; III:2516

HUMAN RELATIONS RESEARCH FOUNDATION, II:1337

ILLINOIS INST. OF TECHNOLOGY, IV:4952

ILLINOIS, UNIV., II: 951, 1024, 1025, 1370, 1371, 1505, 1538, 1640, 1671, 1790, 1791, 1802; III:2762, 2986, 3416, 3548; IV:3936, 4619, 4835, 4896, 4897, 5095

INDIANA UNIV., I:864; II:1183; III:2468; IV:4026, 4100

INSTITUTE FOR HUMAN RELATIONS, I:485, 486; II:1084, 1085, 2094; III:2969; IV:4956

INTERNATIONAL PUBLIC OPINION RESEARCH CORP., II:1470

IOWA, STATE UNIV., I:117, 718; II:946, 1002, 1058, 1059, 1317, 1725, 2113; III:2407, 2408, 2409, 2410, 2411; IV:3754, 3823, 4923, 4924, 4925

JOHNS HOPKINS UNIV., I:284, 457, 658, 716, 783, 784; II:1039, 1213, 1291, 1292, 1438, 1772, 1903; III:2712, 2713, 2714, 2869, 3371, 3535; IV: 4293, 4968

KRESGE EYE INST., II:1750, 1751, 1752, 1753, 1830; III:3125, 3126; IV:4565, 4653

LEHIGH UNIV., II:1622, 1623; III:2968

LEWIS FLIGHT PROPULSION LAB., II:1928

LOCKHEED AIRCRAFT CORP., III:2549

LOUISVILLE, UNIV., III:2374, 2375, 2376

LOVELACE FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH, II:1756, 2242, 2243, 2244; III:3129, 3629, 3630, 3631

LOWELL OBSERVATORY, III:3120

MANAGEMENT AND MARKETING RESEARCH CORP., II:2272

MARYLAND, UNIV., II:1048, 1129, 1130, 1131, 1165, 1282, 1608, 1609, 1645, 1646, 1647, 1659, 1663, 1691, 1759, 1760, 1761, 1883, 1991, 2030, 2044, 2105, 2253, 2254, 2255, 2256; III:2642, 3663

MASSACHUSETTS INST. OF ELECTRONICS, II:1356

MASSACHUSETTS INST. OF TECHNOLOGY, II:1220, 1484; III:2507

MAYO CLINIC, IV:3808

MIAMI UNIV., IV:3963

MICHIGAN, UNIV., IV:4039, 4387, 4986

MINNESOTA, UNIV., I:782; II:1012, 2018; III:2915, 3291, 3382, 3534; IV:3919, 4485, 4692, 4693, 4735

MOUNT HOLYOKE COLL., II:1994

NATIONAL FIRE PROTECTION ASSOCIATION, I:696, 843

NATIONAL RESEARCH CORP., III:2416

NETHERLANDS. TECHNISCH DOCUMENTATIE CENTRUM VOOR DE KRIJGSMACHT, IV:5181

NEW YORK UNIV., IV: 4969

NORTH ATLANTIC TREATY ORGANIZATION Advisory Group for Aeronautical Research and Development, II:1071; IV:3975, 4064, 4075, 4082, 4192, 4249, 4258, 4275, 4372, 4513, 4536, 4560, 4573, 4641, 4670, 4700, 4720, 4721, 4759, 4787, 4867, 4882, 4977, 4978, 5000, 5010, 5162, 5165, 5190

NORTHWESTERN UNIV., I:317; II:1203, 1342, 1343, 1606, 1730, 1731, 1984, 1985; IV:4414, 4415, 4538, 4539

OHIO STATE UNIV., I:103, 104, 110, 154, 171, 472, 695, 874; II:1001, 1015, 1108, 1109, 1110, 1111, 1179, 1231, 1349, 1350, 1396, 1419, 1426, 1427, 1428, 1432, 1531, 1576, 1577, 1652, 1653, 1654, 1655, 1656, 1657, 1722, 1880, 1902, 2023, 2129, 2173, 2174, 2208, 2209, 2210, 2246, 2247, 2248, 2249, 2250; III:2495, 2496, 2497, 2498, 3222, 3270, 3306, 3307, 3308, 3553, 3554, 3555, 3556, 3557; IV: 3722, 3847, 3849, 3850, 3851, 3852, 3853, 3918, 4130, 4141, 4676, 4686, 4739, 4771, 4772, 4773, 4774, 4775, 4776, 4777, 4778, 4866, 5063, 5064, 5065, 5066

PENNSYLVANIA STATE COLL., II:944, 1268, 1519, 2119; III:3260

PENNSYLVANIA STATE UNIV., IV:4597, 4689, 4836

PENNSYLVANIA, UNIV., I:875; III:3096; IV:3809, 3900; IV:3989, 4274, 4928

PERSONNEL RESEARCH CENTER, INC., III:3304

PIONEER SCIENTIFIC CORP., III:2608

PITTSBURGH UNIV. SCHOOL OF MEDICINE, IV:3802

PRINCETON UNIV., III:3570; IV:4458

PSYCHOLOGICAL CORP., I:91, 891; III:2641, 3651, 3652, 3653, 3654; IV:4020

PSYCHOLOGICAL RESEARCH ASSOCIATES CORP., II:1827, 1828; IV:4830

PSYCHOLOGICAL SERVICES, INC., II:2039, 2227; III:3471

PURDUE UNIV., II:2134, 2170, 2273; IV:3749, 3838, 4076

QUARTERMASTER FOOD AND CONTAINER INST., III:2562

RICHARDSON, BELLOWS, HENRY AND CO., II:1351, 2176

ROBERT A. TAFT SANITARY ENGINEERING CENTER, IV:4942

ROCHESTER, UNIV., I:760, 794; II:984, 985, 986, 1283, 1486, 1487, 1890, 1894, 1895, 1978, 2156, 2235, 2236; IV:3734, 3735, 3876, 4209, 4214, 4265, 4266, 4268, 4269, 4270, 4271, 4446, 4770, 4998, 5040, 5146, 5147

RUTGERS UNIV., II:1995

ST. LOUIS UNIV., I:483, 691; II:1564, 1565, 1986; III:2927

SAN JOSE COLL., IV:3973

SPERIDAN SUPPLY CO., I:849

SOUTHERN CALIFORNIA, UNIV., II:1493, 1494, 1495

SOUTHWEST RESEARCH INST., I:692; III:3491, 3492, 3493

STANFORD UNIV., III:2974, 3659, 3660, 3664

SYRACUSE UNIV., II:2278; III:3155

TEXAS, UNIV., I:168, 346, 496; II:1104, 1245, 1907, 2188; III:3541; IV:3845, 4843

TUFTS COLL., I:276, 845; II:1274; III:2630; IV:4901

TUFTS UNIV., IV:4576

TULANE UNIV., I:180, 424, 425, 618, 619, 620, 829; II:1500, 1501, 1502, 1584, 1768, 1769, 2025, 2026, 2118, 2166; III:2415, 2851, 2852, 2964, 3383, 3384, 3390, 3391, 3608, 3610, 3615; IV:4608

U.S. AIR FORCE, I:80, 81; II:955, 956; IV:4043, 4044, 4045

Air Force Cambridge Research Center, III:3120, 3457; IV:3992, 4100, 4470, 4483, 4797, 4812

Air Force Flight Test Center, II:2276

Air Force Personnel and Training Research Center, IV:3857, 4222, 4234, 4236, 5067, 5086, 5087, 5088

Crew Research Lab., III:2651, 3380; IV:3983, 4502, 4503, 4530

Personnel Research Lab., III:2816, 3175, 3176, 3548; IV:3874, 4185, 4189, 4983

Skill Components Research Lab., III:2737, 2738, 2772, 2907, 3491, 3492, 3493

Training Aids Research Lab., III:3473; IV:4986

Air Proving Ground Command, II:957, 958, 959, 960, 961, 962, 963; III:2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356; IV:3702, 3703, 3704, 4354

Air Research and Development Command, II:1814; IV:4952

Air Training Command, IV:5058

Arctic Aeromedical Lab., II:1204; IV:4635, 4636, 4868

Arctic, Desert, Tropic Information Center, II:1596, 1597; IV:3721, 4545

Armament Systems Personnel Research Lab., IV:4111

Directorate of Flight Safety Research, I:577, 809

Holloman Air Development Center, II:1628; IV:3919, 3944

Human Factors Operations Research Labs., II:1084, 1085, 1231, 1337, 1356, 1398, 1531, 1602, 1672, 1722, 2164, 2182, 2183, 2184, 2227, 2272; III:3304, 3471, 3559, 3560

Human Resources Research Center, I:74, 76, 117, 146, 147, 239, 347, 389, 390, 414, 540, 594, 604, 659, 700, 718, 736, 737, 832, 833, 846, 847, 848, 849, 850, 908, 909,

910, 911, 912, 913, 916; II:1087, 1187, 1745, 2140

Aircraft Observer Training Research Lab., I:460, 585; II:1025, 1327, 1648

Armament Systems Training Research Lab., II:1046, 1160, 1466, 1911, 2007

Combat Crew Training Research Lab., II:1616, 1675, 2011, 2012, 2013

Perceptual and Motor Skills Research Lab., I:110, 158, 159, 160, 161, 163, 284, 374, 520, 735, 831, 874; II:946, 948, 1015, 1058, 1059, 1090, 1093, 1094, 1292, 1361, 1396, 1401, 1402, 1403, 1404, 1449, 1451, 1631, 1725, 1879, 1880, 1891, 1998, 2168

Personnel Research Lab., I:162, 272, 311, 391, 394, 497, 560, 834, 851, 914, 915; II:1007, 1271, 1277, 1336, 1413, 1414, 1415, 1469, 1595, 1618, 1711, 1715, 1716, 1780, 2114, 2169, 2193, 2194, 2195, 2196, 2197, 2290, 2291, 2292, 2293, 2294, 2295, 2296; IV:4243

Pilot Training Research Lab., I:328, 329, 550; II:951, 1134, 1409, 1802

Technical Training Research Lab., I:151, 653, 746; II:1024, 1081, 1581, 1636, 1640, 1671, 1846, 1847, 1850, 1851, 2100

Human Resources Research Inst., II:1028, 1029, 1273, 1365, 1560, 2039; III:2338, 2516, 3155, 3291

Human Resources Research Labs., I:298, 412, 472, 695, 711, 712, 713, 714

Military Training Wing, (3700th), II:2073

Office of the Surgeon General, II:1899

Rome Air Development Center
Human Factors Office, II:1247, 1248; IV:3734

School of Aviation Medicine, I:91, 115, 129, 148, 149, 150, 168, 191, 195, 232, 233, 234, 235, 236, 246, 247, 338, 348, 371, 372, 373, 410, 433, 437, 491, 492, 496, 511, 621, 624, 645, 689, 690, 731, 739, 741, 742, 762, 763, 774, 782, 798, 799, 808, 814, 837, 838, 839, 840, 853, 879, 894, 895; II:966, 967, 1012, 1032, 1033, 1042, 1055, 1056, 1066, 1167, 1203, 1206, 1223, 1224, 1241, 1245, 1298, 1318, 1319, 1438, 1442, 1443, 1479, 1480, 1505, 1513, 1514, 1535, 1538, 1547, 1548, 1549, 1557, 1570, 1582, 1610, 1611, 1612, 1639, 1690, 1728, 1730, 1731, 1754, 1756, 1765, 1766, 1790, 1791, 1820, 1842, 1882, 1904, 1914, 1915, 1916, 1984, 1985, 1992, 1993, 2016, 2017, 2018, 2060, 2061, 2063, 2064, 2067, 2082, 2083, 2093, 2096, 2103, 2146, 2177, 2178, 2179, 2180, 2188, 2202, 2203, 2214, 2242, 2243, 2244, 2266, 2267, 2274, 2288; III:2378, 2429, 2431, 2433, 2445, 2514, 2515, 2541, 2567, 2583, 2588, 2629, 2678, 2681, 2703, 2704, 2727, 2766, 2767, 2768, 2769, 2791, 2807, 2865, 2867, 2898, 2899, 2915, 2938, 2954, 2986, 2989, 3024, 3090, 3127, 3129, 3136, 3201, 3212, 3294, 3348, 3359, 3370, 3371, 3382, 3401, 3438, 3441, 3442, 3501, 3508, 3509, 3534, 3541, 3550, 3565, 3572, 3573, 3580, 3603, 3633; IV:3772, 3773, 3774, 3802, 3803, 3816, 3830, 3831, 3845, 3936, 3956, 3960, 4013, 4214, 4302, 4414, 4415, 4450, 4476, 4485, 4538, 4539, 4540, 4664, 4692, 4693, 4716, 4760, 4762, 4843, 4908, 4936, 4968, 5015, 5041, 5069, 5085, 5110, 5177

Strategic Air Command, IV:5021

Wright Air Development Center, I:259, 271, 317, 634; IV:3722, 4561, 5016

Aero Medical Lab., I:121, 122, 154, 176, 196, 197, 198, 199, 200, 238, 240, 262, 276, 294, 321, 323, 342, 366, 367, 380, 459, 480, 483, 484, 503, 504, 505, 506, 513, 533, 548, 549, 581, 582, 599, 608, 642, 643, 647, 648, 691, 719, 760, 775, 776, 780, 794, 815, 836, 856, 857, 901; II:944, 1039, 1050, 1104, 1161, 1162, 1179, 1183, 1192, 1232, 1253, 1268, 1278, 1279, 1280, 1284, 1291, 1342, 1343, 1346, 1349, 1350, 1419, 1426, 1427, 1428, 1432, 1511, 1519, 1522, 1524, 1525, 1555, 1561, 1562, 1564, 1565, 1577, 1603, 1622, 1623, 1652, 1653, 1654, 1655, 1656, 1657; II:1712, 1714, 1724, 1786, 1796, 1816, 1829, 1831, 1832, 1833, 1834, 1849, 1894, 1895, 1902, 1978, 1986, 1996, 2023, 2028, 2080, 2081, 2119, 2129, 2161, 2208, 2209, 2210, 2213, 2246, 2247, 2248, 2249, 2250; III:2340, 2342, 2374, 2375, 2376, 2384, 2386, 2416, 2426, 2468, 2501, 2522, 2523, 2526, 2603, 2605, 2623, 2630, 2656, 2697, 2699, 2712, 2713, 2714, 2754, 2762, 2774, 2777, 2861, 2869, 2873, 2912, 2913, 2921, 2922, 2925, 2927, 2932, 2952, 2958, 2968, 3014, 3015, 3016, 3034, 3040, 3074, 3075, 3082, 3111, 3112, 3113, 3114, 3145, 3146, 3222, 3224, 3225, 3227, 3260, 3262, 3362, 3375, 3388, 3402, 3416, 3453, 3467, 3468, 3472, 3482, 3564, 3585, 3605, 3625, 3634, 3650, 3682; IV:3698, 3770, 3876, 3879, 3880, 3911, 3920, 3953, 3954, 3955, 3963, 3964, 4039, 4108, 4141, 4231, 4293, 4303, 4312, 4329, 4340, 4341, 4342, 4349, 4356, 4365, 4366, 4387, 4416, 4417, 4471, 4479, 4504, 4512, 4562, 4580, 4587, 4595, 4596, 4627, 4648, 4686, 4802, 4832, 4844, 4866 4896, 4897, 4937, 4939, 4942, 4969, 4994, 4998, 5033, 5134, 5204

Aircraft Lab., II:1554, 1555; III:3034, 3259

Directorate of Air Weapon Systems, II:1491, 1492

Directorate of Flight and All-Weather Testing, III:2960; IV:3994

Equipment Lab., I:465; II:1555

U.S. ARMED FORCES MEDICAL LIBRARY, II:2020

U.S. ARMED FORCES-NATIONAL RESEARCH COUNCIL
Committee on Hearing and Bio-Acoustics, IV:4109, 4361, 4654

Vision Committee, I:94, 346; II:1274; IV:4576

U.S. ARMY, III:3159

Aberdeen Proving Ground, III:2955

Adjustant General's Office
Personnel Research Branch, II:1197, 1468, 1827, 1828; III:2764; IV:4612

Army Field Forces, III:2394

Army Medical Research Lab., I:85, 86, 87, 193, 461, 597, 627, 686; II:1463, 1464; III:2811, 2812, 2813, 3105, 3360; IV:4315, 4486, 4551, 4884, 4919

Chemical Corps Medical Labs., I:229, 263; II:1112, 1219, 1355, 1575, 1684, 1845, 1971, 1977, 2252, 2265; III:2499, 2606; IV:3989

Pitman-Dunn Labs., I:749; IV:4461

Quartermaster Research and Development Center, I:670; III:2694, 3346, 3347, 3536, 3537, 3538; IV:3769, 4901

Signal Corps Supply Agency, IV:4924

Walter Reed Army Medical Center, IV:5053

U.S. CIVIL AERONAUTICS ADMINISTRATION, I:325

U.S. CIVIL AERONAUTICS BOARD, I:248, 249

Bureau of Safety Investigation, I:207, 208, 209, 210, 211, 212, 213, 482

U.S. DEPT. OF DEFENSE, IV:4095, 4175, 4177, 4217, 4895, 4996, 5002

U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE, II:1970

U.S. LIBRARY OF CONGRESS, I:877

U.S. NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS, I:501; II:1354, 1358, 1705, 1928; IV:3917, 4915

U.S. NATIONAL RESEARCH COUNCIL, I:94, 346; III:2341, 2393, 2483, 2539, 2586, 2640, 2689, 2914, 2923, 2990, 2991, 3208, 3210, 3211, 3279, 3351, 3417, 3495, 3655; IV:4994

U.S. NAVY
Aero Medical Equipment Lab., III:2739, 3255

Aeronautical Materials Lab., II:1016

Aeronautical Medical Equipment Lab., I:79, 277, 474, 543; II:1156; III:2544, 2631, 2632, 2879, 2910, 3067, 3068, 3253, 3254, 3255; IV:4014, 4337

Aviation Medical Acceleration Lab., I:309, 368, 875; II:1061, 1062, 1330, 1331, 1332, 1440; III:2414, 2540, 2625, 2785, 2786, 2882, 2883, 3095, 3096, 3097, 3314, 3477, 3672; IV:3808, 3809, 3821, 3822, 3900, 3910, 4093, 4256, 4532, 4533, 5017

Bureau of Aeronautics, I:622; IV:4235

Bureau of Naval Personnel, II:1181, 2170; IV:3761, 3823, 3909, 4205, 4206, 4257, 4277, 4278, 4451, 4567, 4570, 4590, 4695, 4783, 4979, 5057

Bureau of Ships, IV:3860

Naval Air Test Center, I:666; II:1866, 1966, 1967; III:2686, 2687, 3244

Naval Medical Field Research Lab., I:458; III:2649

Naval Medical Research Inst., I:384; IV:4102, 4391

Naval Medical Research Lab., I:236, 420, 462, 463, 667, 728, 729, 757, 758, 778, 896; II:1294, 1387, 1389, 1539, 1540, 1541, 1542, 1572, 1650, 1785, 2057, 2229, 2241; III:2608, 2609, 2724, 2886, 2996, 3004, 3007, 3357, 3429, 3431; IV:4358, 4467, 4660, 4751

Naval Radiological Defense Lab., I:536, 537; II:1873

Naval School of Aviation Medicine, I:103, 104, 111, 112, 113, 171, 180, 222, 223, 251, 252, 253, 254, 255, 305, 392, 410, 411, 424, 425, 450, 451, 452, 453, 454, 493, 494, 495, 516, 592, 601, 605, 618, 619, 620, 674, 684, 685, 706, 707, 708, 755, 756, 795, 829, 841, 842, 891; II:982, 1001, 1017, 1018, 1020, 1021, 1022, 1108, 1109, 1110, 1111, 1233, 1236, 1237, 1238, 1311, 1384, 1385, 1500, 1501, 1502, 1587, 1588, 1589, 1632, 1737, 1738, 1750, 1751, 1752, 1753, 1763, 1768, 1769, 1779, 1787, 1788, 1830, 1867, 1876, 1877, 1906, 1947, 2025, 2026, 2055, 2056, 2118, 2125, 2126, 2166, 2173, 2174, 2189, 2190, 2191; III:2370, 2371, 2372, 2421, 2422, 2423, 2495, 2496, 2497, 2498, 2520, 2599, 2600, 2627, 2641, 2716, 2757, 2837, 2838, 2839, 2840, 2851, 2852, 2941, 2944, 2964, 2977, 2978, 3069, 3101, 3102, 3103, 3104, 3125, 3126, 3133, 3135, 3166, 3167, 3187, 3198, 3199, 3200, 3245, 3246, 3270, 3292, 3306, 3307, 3308, 3329, 3389, 3390, 3391, 3424, 3426, 3553, 3554, 3555, 3556, 3557, 3568, 3596, 3608, 3609, 3610, 3612, 3614, 3615, 3617, 3648, 3649; IV:3724, 3725, 3726, 3765; IV:3812, 3813, 3847, 3848, 3849, 3850, 3851, 3852, 3853, 3918, 3973, 3981, 4009, 4010, 4046, 4130, 4187, 4260, 4299, 4300, 4301, 4424, 4426, 4548, 4549, 4565, 4607, 4608, 4640, 4653, 4719, 4729, 4739, 4771, 4772, 4773, 4774, 4775, 4776, 4777, 4778, 4848, 4911, 4912, 5063, 5064, 5065, 5066, 5124, 5125, 5136, 5139

Navy Electronics Lab., II:2232; III:3620, 3621; IV:4021, 5198

New York Naval Shipyard, III:3151

Office of Naval Operations, IV:4730

Office of Naval Research, I:864; II:2089; III:2383, 2974, 3383; IV:3729, 3814, 3877, 3883, 4153, 4201, 4225, 4284, 4385, 4390, 4566, 4701, 4769, 4808, 4854, 4920, 4956, 5062, 5158, 5206

Naval Research Lab., I:457, 658, 716, 784; II:1163; III:2491, 2492, 2547, 2548; IV:4475

Special Devices Center, I:783, 845; II:984, 986, 1283, 1324, 1351, 1470, 1486, 1487, 1994, 2113, 2134, 2156, 2176, 2235, 2236; III:3267, 3651, 3652, 3653, 3654; IV:3735, 3749, 3838, 4020, 4076, 4209, 4265, 4266, 4268, 4269, 4270, 4271, 4274, 4446, 4597, 4619, 4689, 4836, 5040, 5146, 5147

Office of the Chief of Naval Operations, IV:3951, 3952

Office of the Surgeon General, II:1180, 1207, 1621, 2015, 2270

Philadelphia Naval Hospital, I:236

Philadelphia Naval Shipyard, III:2771

U.S. OFFICE OF TECHNICAL SERVICES, I:677

U.S. RESEARCH AND DEVELOPMENT BOARD, I:318, 703

U.S. WEATHER BUREAU, II:1552

UNIVERSAL MATCH CORP., III:3575; IV:5092, 5093, 5094

VIRGINIA, MEDICAL COLL., III:3292

VIRGINIA, UNIV., I:581, 582; II:1996, 2089; III:2912, 3111, 3112, 3113, 3114; IV:4340, 4341, 4342, 4512, 4561, 4562, 4844

WASHINGTON UNIV., I:271, 311, 853; II:1206, 2082, 2083, 2202, 2203, 2228; III:2541, 2623, 2703, 2704, 2807, 3482, 3572, 3573, 3613, 3616

WASHINGTON, UNIV., II:1204

WESTERN ONTARIO UNIV. (CANADA), IV:4241

WESTERN RESERVE UNIV., IV:5041

WESTINGHOUSE ELECTRIC CORP., IV:3740

WETMORE HODGES AND ASSOCIATES, II:1192

WILLIAMS COLL., II:1624

WISCONSIN, UNIV., II:1160, 1714, 1849, 1891; III:2384, 2386, 3074, 3075, 3224, 3227, 3262

WOODS HOLE OCEANOGRAPHIC INST., III:3318

V
4

ISBN